

UNITED STATES. CIRCUIT COURT. DISTRICT OF
CONNECTICUT

National Phonograph Company	} IN Equity. Suit no. 1076 on Patent No. 667,662
versus	
American Graphophone Company	

BRIEF FOR DEFENDANT -- 1904.

UNITED STATES CIRCUIT COURT.

District of Connecticut.

NATIONAL PHONOGRAPH COMPANY

vs.

AMERICAN GRAPHOPHONE COMPANY.

} Suit No. 1076 on
Patent No. 667,662.

BRIEF FOR DEFENDANT.

PHILIP MAURO,

Of Counsel.

PRESS OF BYRON S. ADAMS.

INDEX.

	PAGE.
Summary of the Case and Argument.....	i
The Art of Recording Sounds. Its origin in Defendant's Bell & Tainter Patent.....	2
The Copying of Sound-Records by means of <i>Duplicating Machines</i> . Tainter and Macdonald patents.....	3
Molded Records. In making the mold the original record serves as a "pattern" instead of a "master." <i>Defendant's right to make a mold is conceded</i>	4
Defendant's right to use its mold is what complainant disputes. Defendant uses the mold according to its own patented process.....	5
Casting Sound-Record Cylinders	5
Origin of Defendant's Process	6
It was invented in 1895-6, and consists in modifications of the ancient casting process, which modifications are admittedly the invention of defendant's assignor, Macdonald	6-8
The Patent in Suit. On its face a very limited patent, relating to a process "of the character covered by" an earlier patent (1892).....	8
The Novel Details of the Patent in Suit. In all of these it differs radically from defendant's process.....	11
Claim 1 —attempts to cover, as a process of "duplicating" the common expedient of allowing for shrinkage.....	13
The peculiarity specified in the claim does not lie in the "process" but in the pitch of feed-screw of the recording machine used in making the original record.....	14
Claims 2, 4, and 5 —attempt to cover the ordinary way of removing a casting from a cylindrical mold.....	15
Three Methods of Molding. (1) casting (2) pressing (3) dipping—Defendant's process is a "casting" process; complainant's a "dipping" process not invented by Edison.....	17
General Considerations. Characteristics of a process. The ancient casting process includes cooling, with its necessary results (congealing and contracting). The single word "casting" describes the <i>entire process</i> of claims 2, 4 and 5.....	20
A process is the same whether performed in a mold having a plain surface or one having a marked surface.....	22
Testimony regarding the Process of Casting Blank Cylinders.....	25
The Prior Art	28
Lioret and Young Patents of 1894. Describe continuous molds, and the removal of the record by cooling and thereby contracting "sufficiently to permit the easy withdrawal" of the record..	29

History of Edison's Experiments in Casting Records....	33
Edison discarded split-molds in 1888, and testifies that he adopted continuous molds not in consequence of the discovery of a new process, but of "materials that would shrink enough".....	34
<i>The Casting process abandoned in 1888 because of the "enormous difficulties" in the way.....</i>	35
<i>Edison's Deposition.....</i>	35-44
<i>The Vice of the Claims in Suit.</i> They seek to appropriate a necessary consequence of cooling as if it were a "step" in a process.....	45
Supreme Court's Definition of "Process"	48
The claims in suit do not conform to this definition.....	49
<i>National Meter Co. v. Neptune Co</i>	50
Anticipation by Manufacture of Blank Cylinders	52
Anticipation by Edison's 1892 Patent.....	54
The Appelt and Day Patents	63
Anticipation by Lioret and Young.....	64
The Prominent Characteristics of Claim 1	67
Claim 1 Does not Specify an "Invention"	68
It covers nearly a common workshop expedient—making allowance for shrinkage.....	69
It covers merely the use of the "shrinkage rule"	70
It specifies only what was previously done and what of necessity occurs every time a sound-record is cast	71
It specifies an expedient which, even if new, would have been obvious	73
It depends, not on the act specified therein, but upon external conditions	75
Complainant's Argument in Support of Claim 1	75
Claim 1 does not Specify a "Process"	79
Claim 1 does not Specify a Process of Making Sound-Records.....	80
A Result not Patentable, O'Reilly v. Morse	83
<i>Howe v. Abbott and other authorities.....</i>	88
A "Double Use," not patentable.....	89
Analogous Use. Brown v. Piper.....	91
<i>Leroy v. Tatham.....</i>	94
<i>Pa. R. R. Co. v. Locomotive Co.....</i>	96
Decisions of C. C. A. in this Circuit	98
Macdonald the Prior Inventor.....	99
<i>Campbell Co. v. Duplex Co.....</i>	105
<i>Thread Co. v. Willimantic Co.....</i>	105

ds. 33
opted
new 34
mod 35
35-44
reces- 45
48
49
50
52
54
63
64
67
68
allow 69
70
essity 71
been 73
con 75
75
79
nd- 80
83
88
89
91
94
96
98
99
105
105

Wright v. Postel.....	106
Christie v. Seybold.....	106
Abandonment	109
<i>Kendall v. Winsor</i>	114
The Specification is Fatally Defective	118
Patent Act of 1897	122
Edison's Patent, No. 713,209	123
The Claims Cover Unpatentable "Aggregations"	127
Infringement. Defendant does not infringe.....	128
Utility of Macdonald's Process	135
Appendix I. Mr. Dyer's Deposition	138
Mr. Dyer's close personal relations with the patentee render his opinion upon the latter's achievements valueless.....	138
Mr. Dyer's Imputation of Ten Errors of Fact to Defendant's Expert ..	141
The alleged "errors" examined in detail and the charge re- futed	142-152
Mr. Dyer's Remarkable Comparison of Defendant's Process with the Patent in Suit	152
How the Allowance of Claim 1 was Procured	154
Appendix II. Mr. Edison's Methods those of the <i>investigator</i>, rather than those of the inventor	159
Edison's History as a Patentee and Litigant Reviewed, showing that "history repeats itself," and that the "popular estimate" is, as usual, incorrect	163
Appendix III. An English decision on a patent for molding records	169

SUMMARY OF THE CASE.

The broad outlines of this case indicate quite clearly its true character. What is involved is the manufacture of sound-records by casting them in a mold—that is to say by introducing a suitable material in a melted state into a mold, allowing it to congeal in the mold, thereby taking the impression of the surface thereof, and, when sufficiently contracted in consequence of cooling, withdrawing the casting from the open end of the mold. This is a process which has been known and practiced for ages.

The successful production of sound-records by this ancient operation of casting requires (1) a mold which bears upon its inner surface a faithful representation (in reverse) of a sound-record; (2) a fusible material which has the properties of taking and retaining a sharp impression of the surface of the mold and of shrinking enough upon cooling to clear the latter and admit of removal.

Given these two things it is manifest that, in proceeding as above described, one is simply practicing the operation of casting just as it has been carried on for ages. Certainly it was not a novelty and not an invention to melt the ordinary wax, and, introduce it into the mold and let it set therein, and complainant concedes this. We contend further that it was certainly not an invention and not a novelty to let the casting remain in the mold until sufficiently cooled, and then to take it out.

This is the disputed proposition.

The Patent in Suit.

The patent in suit is not for a new mold or manner of making it, nor for a new material adapted for use in casting sound-records. On the contrary it is conceded that the mold described in the patent has been known for many years (and moreover that defendant does not use that sort of a mold) and that the materials referred to in the patent are such as had been in general use for making sound-records for twelve years before the patent was applied for. It had, moreover, been common during all those years *to cast those same materials in continuous cylindrical molds, withdrawing the casting lengthwise out of the mold, thereby producing the blank cylinders upon which sound-records are made.*

The operation whereby the blank cylinders have been made involved precisely the acts and effects recited in the claims involved in this suit, to wit, introducing the wax in a melted state into the mold and, after the casting had set and sufficiently contracted, taking it out of the mold in the ordinary way.

This manner of removal of the casting is called "shrinking it out," which expression indicates with sufficient accuracy what is meant, but is inaccurate and misleading in that it suggests an operation *performed on* the article, whereas what actually occurs is the spontaneous and inevitable action of the material itself. Therefore, instead of saying that the operator contracts the material, we should say that the material itself contracts. The mere correction of this inaccuracy disposes of the whole case; for it is clear that the recitation of the shrinkage of the material is not the recitation of a step in a process, but of the inevitable *effect* of cooling.

Therefore, in telling us to cast the record in the mold and to take it out *after* it has sufficiently contracted (manifestly

it could not be taken out *before* that occurs), the patent has told us nothing new.

In Edison's 1892 patent (applied for in 1888) he described his peculiar method of making a sound-record mold, and the operation of *casting* sound-records therein, using the ordinary wax-like materials. The only difference between that patent and the claims in suit is that the former suggested that the mold be made in sections, and opened to remove the sound-record. We contend that it did not involve invention to substitute a continuous mold for a sectional mold, particularly as it was found that the latter did not give a satisfactory product.

Although the patent in suit does disclose a process or procedure which is apparently new in some of its features, the defendant does not use such new process, nor is there any pretence that it does so. These apparently new features are the introduction of the melted material *upwardly* into a mold having a very *cold surface*, so as to produce an "almost instantaneous chilling" of the cast material.

Defendant's Process.

Assuming the previous existence of the mold and material (as is conceded in this case) there never was any difficulty in casting a sound-record; for, of course, by pouring the melted material into the mold one was bound to obtain a casting of some sort. It was, however, difficult to obtain a *good* sound-record, *i. e.*, one which received an accurate impression of the tiny undulations of the sound-record. Hence, for the purpose broadly of making sound-records there was neither utility nor novelty in the operation of casting the old material into the old mold, and withdrawing the casting in the usual way when sufficiently cooled.

Obtaining *good* records by this old process was *not* an invention, but a *result*.*

Defendant's assignor, Mr. Macdonald, discovered in 1896, that he could obtain a cylindrical casting which copied faithfully the surface of the mold, *even to the buffing marks* (D. R., p. 55, Q. 31) by a new departure from the ordinary operation of casting, which new departure consisted in *superheating the mold and its contents and suddenly chilling from the high temperature*. This process was used by defendant for making sound-records long before the Edison patent in suit was applied for, and its use at defendant's factory had reached the high aggregate of *over twenty thousand per diem* in the fall of 1902 (D. R., p. 109, ×-Q. 21). The process is carried on by defendant in accordance with and under the protection of letters patent duly granted to it as the assignee of Mr. Macdonald, its inventor (Patents Nos. 682,991 and 682,992, dated September 17, 1901).

Differences Between Macdonald's Process and Edison's.

Enough has already been said to show that the processes differ radically, and that *whatever features they have in common are old*. Macdonald departed from the ordinary casting process in the steps of *superheating the melted wax after its introduction into the mold and suddenly chilling it down from the high temperature*. In carrying on his process he introduces the melted material into the *top* of the mold.

* We direct special attention to this proposition which is unquestionably sound, and which is decisive of the case. That the complainant is seeking by this patent to monopolize a *result* instead of the *new means* (if any) set forth in the patent whereby that result is accomplished, is clear. The law on this subject, clearly enunciated in *O'Reilly v. Morse*, and other cases (p. 83, *infra*) is definitely settled.

Edison's specific method of applying the ordinary operation of casting was by introducing the melted wax *upwardly* through the *bottom* of the mold, the latter being *cold* so as to effect the *almost instantaneous chilling of the casting*.

Macdonald's process is, as already stated, practical and useful, and as its result the public received the first molded records ever placed on the market (upward of a year before complainant put molded records on the market).

Edison's patent process led to nothing. In order to be able to say that it is even operative *it was necessary to have a witness construct an apparatus and try an experiment after this suit was brought.* (C. R., p. 125, Qs. 69-70.)

Moreover, the testimony is that the supposed invention of the claims involved in this suit was made *in 1888*. Yet Edison's company was not able to produce successful cast records for more than twelve years thereafter.

The history of Edison's efforts at molding records, *as told by himself*, is that he tried to cast records in continuous molds in 1888; that he discarded the *casting* process in that year (1888) for what he says was the *superior* method of *pressing*. Complainant eventually succeeded in making molded records by a peculiar process of "dipping" and a peculiar apparatus employed therewith described in Aylesworth & Miller patents No. 683,615 (process) and No. 683,676 (apparatus), both dated October 1, 1901, and by means of a peculiar composition *which complainant keeps secret*.

In trying to show that Edison's patent in suit covers an operative process, the witness (Aylesworth) did not use the materials described in the patent in suit but *the secret composition above referred to*.

Such is broadly the state of facts upon which complainant attempts to stop defendant's business.

The claims sued on.—The claims which are urged in

this case are those numbered 1, 2, 4 and 5. Claim 1 will not be discussed in this introduction further than to say that it is an attempt to cover, in molding sound-records, the common and time-honored expedient of making allowance for the shrinkage of the molded article. Claims 2, 4 and 5 (which are identical in substance), if construed without regard to the state of the art, and without regard to the specification, would have the effect of covering any and all methods of casting sound-records in continuous cylindrical molds. Everyone would infringe these claims who cast melted material (of any sort) into a cylindrical sound-record mold and (after the casting had sufficiently cooled) lifted it out of the mold. The claims, as interpreted by complainant's expert, rest—not upon the operation of casting (which is the only "process" involved) but—upon *the act of taking the record out of the mold* by "a longitudinal movement." Not only is this the ordinary movement given to an article in taking it out of a continuous mold, but, to call that act a "process," or part of a process of *making* the article, is, in our opinion, absurd on its face.

Many defenses are set up and established, and among them are the following :

1. Upon the face of the patent, and in view only of those familiar facts whereof the court takes judicial notice, the claims, if broadly construed, are void. We contend that the operation of casting the old material in the old mold, *including the act of taking the record out of the mold after the inevitable shrinkage which occurs in cooling*, was COMMON PROPERTY, which the public had the right to use and to improve upon.

2. The act of taking the record out of the mold by withdrawing it lengthwise was not a novelty at the date of the application for this patent, but had been done, not only

with other materials than those used for sound-records, but with the *same* material in the manufacture of sound-record tablets.

3. The act of removing the record by "a direct longitudinal movement" did not require the exercise of the inventive faculty, but only the most ordinary intelligence.

4. The claims do not define a "process." One contention of complainant is that novelty resides in the use of a continuous mold instead of a sectional or split-mold. If it were new and patentable to substitute a continuous mold for a split-mold in a process of casting, the change in the instrumentality *would not constitute a change in the process*. The only change of procedure involved with this change in the character of the mold is in the manner of removing the article from the mold. This is not a new process, but the ordinary way of removing a casting from a continuous mold.

5. The act whereby an article is taken out of the mold in which it was cast is not a part of the process of *making* that article, which is complete before its removal from the mold.

6. The use of a cylindrical mold was not a process or invention whereby a new result was accomplished, but was itself a *result to be accomplished*.

7. The alleged process of the claims sued on was anticipated by the common practice of casting blank cylinders in continuous cylindrical molds.

8. The alleged process was anticipated by Edison's patent of 1892, as well as by the Lioret and Young patents.

9. The alleged process of these claims was not an invention in view of the prior art, as shown by the Appelt and Day patents.

10. The alleged invention having been made in 1888, was abandoned by the delay of twelve years in making

application for patent, and by the issue in the interim of the split-mold patent of 1892.

11. Edison set aside his experiments in casting records in the year 1888, because they were unsuccessful and incomplete, and he made no progress thereafter. The successful commercial results accomplished by complainant have been attained by the "dipping" process and by the system of apparatus invented and patented by Miller and Aylesworth in the year 1901, when used in connection with a secret composition. Edison's patent, therefore, cannot be sustained against another patentee who made, perfected and put his invention upon the market during the period of Edison's delay and inaction.

12. The contention that the production of sound-records in molds was waiting for the discovery that the record could be taken out of the mold is not only absurd on its face, but is disproved by complainant's own testimony, which shows that Edison discarded all attempt to use sectional molds in 1888, and yet complainant was unable to put molded records upon the market until 1901.

13. The contention that Edison discovered, in 1888, a new way of using a continuous mold (namely by withdrawing the cast record lengthwise when sufficiently cooled), and that the use of continuous molds was rendered possible in consequence of this discovery, is untrue. What Edison discovered by his attempt to use split-molds was that such molds would not yield a satisfactory product. He resorted to continuous molds, not because he "discovered" a new way of using them, but because he discovered that the split-mold left the marks of the seams upon the product, and this was undesirable.

14. Macdonald is an original inventor. He made his invention in 1895, reduced it to practice in 1896, and applied it to making sound-records in 1899. He had pro-

duct therefrom upon the market in 1900. Edison, *per contra*, abandoned his casting experiments in 1888 because of "enormous difficulties in the way." Therefore, even if there were any new features, common to his process and that of Macdonald, the latter would be, in law, the prior inventor. (See p. 99 *infra*.)

15. The patent in suit is fatally defective. Edison testifies that it requires a special kind of material to make sound-records by the process of the patent in suit. No materials capable of such use are mentioned in the patent. The *only* material which is said to have the properties necessary for such use is complainant's secret composition.

16. Defendant does not infringe. That there is no conflict between the Macdonald process and that of the Edison patent in suit is clear upon comparison, and is indicated by the fact that there was no interference in the Patent Office, where the applications were pending contemporaneously. In the claims sued on the step which immediately follows introducing the material into the mold is "allowing the molten material to set." In defendant's process a radical difference is caused by the introduction of the step of superheating the material after its introduction into the mold.

Moreover, it will be seen that it is necessary, in order to sustain the claims as for a new and operative process, to construe them narrowly, in which case there is no infringement.

There is no evidence at all of the infringement of claim 1 as interpreted by complainant's expert.

Complainant's Contention.

It is contended on behalf of complainant that when Edison conceived the idea of using a continuous mold and "shrinking out" the records, he made an "invention"—that the

idea of doing this was an "inventive" idea—the idea of new and patentable means.

(1.) To this proposition we say, in the first place, that it does not correctly state what happened. It is not accurate to say that Edison conceived the idea of using a *continuous* mold. His idea was to use a sectional mold, and he thought so well of the idea that he suggested in his application for patent filed in 1888, for which patent No. 484,582 issued in 1892; but he found in attempting to do it, that the sectional mold did not give a satisfactory product. Hence, he was constrained to fall back upon the alternative of employing a continuous mold, in the use of which it is necessary to wait until sufficient contraction of the article has taken place before removing it from the mold.

We contend that the choice between the sectional mold and the continuous mold was not a matter of invention, but one of judgment; but however that may be, the admitted fact is that Edison, in exercising this judgment and making this choice, chose the wrong road and had to turn back.

When Edison thought of using a mold for the production of sound-records and made a choice of sectional molds, he *of necessity thought of the continuous mold*, even in the act of mentally rejecting it. Therefore, the continuous mold (including the ordinary mode of using it) was thought of (and hence "invented" if we admit it to be an invention) when the choice was made between it and the sectional mold. If the thought of using it was an invention, the thought of *not* using it was equally an invention, since both thoughts involve equally the mental existence or conception of the thing. Thus we see, in the light of the actual facts, that the proposition under discussion involves an absurdity.

3. The thought of using a continuous mold was the thought of *something to be accomplished*, and not the creation of a *new means*. Plainly, if the accomplishment of this re-

sult (casting records in continuous molds) was self-executing, requiring *no new means*, there was nothing to invent. But, on examining the problem, we perceive that special means *were* necessary to its successful solution — that is to say, the successful doing of the thing thought of required a material having suitable properties in respect of melting, congealing, taking a smooth and accurate impression of the mold-surface, etc. We are not now inquiring whether a *new* material had to be invented, but merely pointing out that the means (or subject of possible invention) was in the material used in the proposed operation, and that the latter could not be performed *unless* such a material be employed.

These considerations make it very evident that the thought (of using a continuous mold and shrinking out the product) was *the thought of something to be done*, and that for the “inventive” thought we must look to *the means employed in the doing of that thing*.

4. That no invention was made in conceiving the idea of using a continuous mold is further apparent from what Macdonald did. That it required no invention on his part is proof that none was required.

5. That no invention was required in conceiving this idea is further evident from Edison's own testimony and that of other witnesses, and is recognized by his own counsel, as will be shown in the body of the brief.

6. That no invention was required or exercised in the conception of the idea of using a continuous mold is most impressively shown by Edison's conduct, not merely in waiting twelve years to assert a claim to this invention, but in disregarding the opportunities presented to him for making such a claim. The evidence shows, not only that Edison made no invention in this regard, but that he never was under the illusion that he had done so.

United States Circuit Court,
District of Connecticut.

NATIONAL PHONOGRAPH CO. }
v. } No. 1076.
AMERICAN GRAPHOPHONE CO. } Patent No. 667,662.

BRIEF FOR DEFENDANT.

We do not regard this suit as serious in the sense that the complaint has any merit whatever. It is serious *only* in that it is aimed at a manufacture conducted by defendant which, in the fall of 1902, had reached an output of more than twenty thousand sound-records *per diem* (D. R., p. 103, Q. 120; p. 109, Q. 21) and is now much greater. The bare possibility of interfering with such an enormous business of its competitor is deemed by complainant sufficient inducement for pressing this suit. To defendant, the only element to be reckoned with is the "judicial hazard." The merest chance of a menace to so important a business justifies a most complete and elaborate showing by way of defense.

Defendant is using a process, invented and perfected by it long before the grant of the Edison patent in suit, and which is covered by patents granted to defendant. This suit is merely an attempt, by means of a paper patent, to destroy an important industry created long before that patent issued.

The Art of Recording and Reproducing Sound.

This art, though now of great extent and importance, is of relatively recent origin.

The making of sound-records by cutting or engraving in waxlike material was patented to Bell & Tainter, May 4, 1886, patent No. 341214. (D. R., pp. 205-220.) [N. B. In this brief Complainant's Record will be cited as "C. R." and defendant's as "D. R."] This patent, which was owned by defendant, expired May 4, 1903. It was sustained in many suits, was a pioneer patent, and during its existence controlled the art. The commercial art had its origin in this patent, there being nothing ahead of it but the proposal of Cros in 1877 to make records by photolithographing and etching, and Edison's unsuccessful attempt, later in the same year, to make sound-records by indenting tin-foil. Judge Shipman, in *American Graphophone Co. v. Leeds, et al.* (87 F. R., 873), describes the Cros French patent and the Edison tin-foil phonograph (Particularly Edison's British patent, No. 1644 of 1878, which complainant's expert refers to in this case. C. R., p. 206—as containing some of his "dreams and hopes.") pointing out the defects which caused its complete commercial failure. Speaking of the Bell and Tainter invention, Judge Shipman said (p. 876) that it—

"converted the noteworthy, but short-lived, instrument of Edison, into a machine of widespread use and of permanent utility."

And summing up the work of Bell and Tainter in comparison with the negative results of their predecessors in the same field, Judge Shipman said:

"Bell and Tainter made an actual *living* invention which the public are able to use, and a court

is not called upon to struggle to decipher an anticipation in the *unfinished work* and the *surmises* of earlier students of the same subject."

Under the protection of this patent defendant, the American Graphophone Co., developed the art, and the complainant, the National Phonograph Co., enjoyed a license under it while it was in force (D'ft's Ex. Graphophone-Phonograph Agreement, D. R., 193).

Duplicating Machines.

Having now, as the fruit of Bell & Tainter's great invention, a sound-record which could be removed from the machine on which it was made and reproduced on other machines, and which could be handled and transported, it quickly became desirable to obtain means whereby original sound-records could be economically multiplied. This was first accomplished in a commercial way by what are called "Duplicating Machines," which are referred to by many of the witnesses.

Illustrations of duplicating machines are given in patent No. 341287 granted May 4, 1886, to Mr. Tainter (D. R., p. 222), and in patent No. 559806, granted to Mr. Macdonald (D. R., p. 262), whose inventions have contributed largely to the development of the art.

Duplicating machines act upon the principle of the mechanical transference (or copying) of the undulatory line on the original record to or upon a blank cylinder. A tracing point or stylus rubs over the undulatory line on the original record, and imparts its movements to a cutting stylus, which thus engraves a copy of the undulatory record upon the blank cylinder. Records produced in this manner are called "duplicates" to distinguish them from "original" records.

Inasmuch as the original records are made in wax-like

material, the wear incident to their use as "master" records in duplicating machines, would quickly obliterate the undulations to an extent sufficient to impair the distinctness of reproduction. Hence but a small number (say 25) duplicates could be made from one original.

Molded Records.

The multiplication of sound-records by means of duplicating machines has now been superseded by the more economical and superior method of casting them in a mold. In the operation of molding records, the original record, instead of being used as a "master" in a duplicating machine, is used as a "pattern" from which a mold is prepared.

The making of a mold, whose inner surface shall bear a faithful copy of the exceedingly minute irregularities which constitute a record of sounds, is, of course, a matter of great nicety; but the method of preparing the mold is not involved in this suit, since the method employed by defendant is one which it has an undisputed right to use. The complainant in this suit finds defendant in admittedly rightful possession of a mold. The question to be decided is, does defendant *use* that mold in a manner which complainant has the right to monopolize by the patent in suit.

The use which defendant makes of this mold is as follows: The wax-like material is melted and poured into the mold, the mold and melted wax therein are then superheated to a temperature of about 350° F., they are then rapidly cooled until the record has congealed and shrunk loose from the mold, when the record is withdrawn.

Obviously, the operation of melting the material, pouring it into the mold, and allowing it to congeal and con-

tract, is simply the ancient method of casting. Defendant has taken the ordinary method of casting, and has modified it by adding the steps of superheating and chilling from the high temperature. This improvement was invented by Mr. Thomas H. Macdonald, and is covered by his patent No. 682991, dated September 17, 1901, and duly assigned to defendant (C. R., p. 319). This patent was applied for Nov. 3, 1900, before the grant of the Edison patent in suit, and was granted without any conflict or interference with said Edison patent.

Casting Sound-Record Cylinders.

The origin of the application of the ancient method of casting to the production of sound-records was as follows:

The wax-like material, whereof sound-record cylinders have been made for more than fifteen years past, melts at a low temperature (under 300° F.) and is therefore well adapted to casting. In fact the sound-record cylinders have been since 1888, as they now are, cast in continuous tubular molds (C. R., 133, X-Q. 111). This wax-like material has a very high coefficient of expansion and contraction, as has been well known for more than fifteen years. The shrinkage is many times greater than what is necessary to clear the grooves of a sound-record, which are not above the one-thousandth part of an inch deep, i. e., less than the thickness of a very thin sheet of tissue paper. Complainant's witness, Pierman, had known from observation of the great shrinkage of this wax-like material for fourteen years (prior to April 30, 1902), and had known of the use of continuous cylindrical molds *in this art* for about ten years prior to that date (C. R., p. 24, X-Qs. 94, 95; p. 25, X-Q. 102).

Other witnesses of complainant testify to the same effect. (Aylesworth, C. R., p. 122, Q. 56, *et seq.*; Miller,

p. 96, R-Q. 104.) Many patents refer to the great shrinkage of this material (D. R., pp. 22-24).

These blank cylinders, made by casting in continuous cylindrical molds, were finished by being turned down to give them a true, smooth surface suitable for recording. The surface of the cylinder when taken out of the mold was rough, mainly because of the presence of minute air-bubbles entrapped between the melted material and the wall of the mold.

Origin of Defendant's Casting Process.

In 1895 Mr. Macdonald, defendant's factory manager, and an inventor of high standing in this art, conceived the idea of casting blanks with a smooth surface, thus saving the operation of shaving. To this end he had an apparatus constructed (D'ft's Ex. Macdonald's 1895 Mold), by means of which he could, after the melted wax was poured into the mold, *superheat it* (by admitting superheated steam into the jacket) and then suddenly chill it (by admitting cold water into the jacket). The idea of this procedure was that the superheating would expel all air-bubbles and make the wax limpid, so that it would take perfectly the impression of the surface of the mold. This apparatus was used in 1896 (Macdonald, D. R., pp. 54, 55). A photograph of this apparatus is printed on p. 197, D. R.

This apparatus and method made casts which *took perfectly the surface of the mold*, even the buffing marks (p. 55, Q. 31). But an unexpected result occurred, namely the surface of the cast cylinder was *too hard for the recording tool* (Q. 26). This hardening of the surface, caused by chilling down quickly from a high temperature, was undesirable for a blank cylinder, but *very desirable for a molded record*.

At this time, therefore (1896), not only had defendant used for many years the ancient casting method for making blanks, but Macdonald had invented a *specific process* which consists of the old casting method modified by superheating the mold and contents, and suddenly chilling from the high temperature. Defendant's molding process was therefore completed in 1896; but defendant did not possess good sound-record molds at that time. Macdonald procured an electrotpe mold of a sound-record in the spring of 1899 (p. 57, Q. 40; Byrnes, p. 75, Q. 7; Osborne, p. 76, Q. 11); and practiced the process with it. Complainant's witness, Pierman, knew of Macdonald's process as early as the fall of 1899 (C. R., p. 22, X-Q. 69). Other molds followed, and the product of this process was used by defendant commercially in the latter part of the year 1900, and the molded records made thereby were put on sale at the same time (Belcher, D. R., p. 107, Qs. 2, 3; p. 80, Q. 2; p. 118, Qs. 8-10).

This was *more than a year before the complainant first put a molded record upon the market.*

Complainant, in making its molded record, does not use (as the patent in suit directs) the ordinary composition, but uses a *secret composition*, discovered by Aylesworth (Aylesworth, D. R., p. 13, Qs. 4-12, and p. 14, Q. 17; Edison, C. R., p. 148, Q. 66; p. 157, X-Q. 104), which is alleged to be different from the ordinary wax-like (soap) composition (Rosanoff, C. R., p. 258, X-Qs. 20, 21). Nor does complainant use either the casting operation or the apparatus described in the patent in suit, but uses a peculiar "dipping" process and an apparatus for practicing the same, invented and patented by Aylesworth & Miller (patents Nos. 683615 and 683676, both dated October 1, 1901; C. R., 232, 329; D. R., 283, 289).

Defendant's process for casting sound-records was thus invented by Macdonald as early as 1896 (five years before the grant of the patent in suit, February 5, 1901) and was in full commercial use before the issue of that patent. Macdonald's application for patent for his process was filed November 3, 1900, and was granted September 17, 1901, patent No. 682991 (C. R., p. 319), together with a patent (No. 682992) for the super-hardened sound-record obtained thereby. Although Macdonald and Edison applications were pending concurrently there was no conflict between them.

Thus defendant, operating under a patent for a process *invented in 1896*, is menaced by a patent issued in 1901, describing a process which has never gone into use at all.

Therefore, the presumption is very strong that defendant is not using any invention which can properly be covered by the patent in suit. This presumption becomes a legal certainty when it is seen that defendant's process differs from the ancient method of casting articles in a mold *solely in respect of features whereof Macdonald is the undisputed inventor.*

Brief Explanation of Patent in Suit.

The patent in suit, No. 667662 (C. R., p. 313), dated February 5, 1901, applied for May 8, 1900, states at the outset that it is not for any new departure in the sound-recording art, but says:

"My invention relates to an improved process for duplicating phonograph records, and the process is of the character covered by my patent No. 484582, of October 18, 1902, wherein a matrix of an original record is employed as a mold for the making of the duplicates."

From this statement we learn several pertinent facts; *first*, that molding sound-records had already been described in a prior patent (and as we will see the specific process of this earlier patent was "casting"); *second*, that the invention of this patent in suit is a "process for duplicating sound-records," and not an improvement in *apparatus* (that is, in the mold used in practicing the process); and *third*, that the process is a precise and definite one, being "*of the character covered by*" the earlier patent. From this last statement it follows that, by ascertaining what is "covered by" the 1892 patent, we determine the "character" of the process of the patent in suit. As we shall presently see, the only process "covered by" that 1892 patent, was one whose distinguishing feature was the making of a mold by the vacuous deposit of a film of metal upon the surface of the original wax record. We state in passing that defendant does not use a process of this character, nor is it pretended that it does. We shall also see that, while the earlier patent recommended that the mold be divided into sections, so as to facilitate removal of the casting, *not one of its claims referred to using a sectional mold*. It described and illustrated the continuous mold, and all its claims related to and covered the use of such mold.

The patent in suit proceeds to state that the process *depends upon the fact* that after a soap mixture (meaning the ordinary sound-record composition in use for many years) has been cast in a mold and allowed to set, it contracts sufficiently to admit of withdrawal from the mold (p. 1, lines 27-37). Obviously the removal of sound-records from continuous cylindrical molds does indeed depend on this well-known fact of the shrinkage of the wax-like material; but it will be noted that this fact is stated simply *as a fact* and not as a new discovery.

We have already seen that it had been a matter of common knowledge for fifteen years preceding this patent.

Again we note that the patent in suit specifies *no new or peculiar material* for use in this process. We read that the material

"may be of *any suitable character*; but preferably it is a metallic soap or a combination of several soaps, to which has been added a material not affected by water, such as ceresin" (p. 1, lines 70-76).

Metallic soaps (saponified stearic acid) had been used since 1888, and the specific mixture of a metallic soap with ceresin, is described in Macdonald's patent No. 606725, granted July 5, 1898 (applied for November 27, 1896). (See Macdonald's testimony, p. 81, Q. 5; p. 84, Qs. 20, 21; D. R. and the copy of specification, p. 275.)

Again we note that there is no attempt either to assert the novelty of a *continuous* cylindrical mold, nor to limit the process to the use thereof. Manifestly, a *process* is not defined by the construction of the apparatus employed therewith; but apart from this, the specification nowhere limits the patent to a continuous cylindrical mold. *Per contra* the specification says (p. 1, lines 50-56) :

"The apparatus illustrated in the figures is designed for the duplicating of cylindrical records, and it will be so described; *but the applicability of my process for the duplication of other varieties of records will be apparent to those skilled in the art.*"

The mold being old (described not only in the 1892 patent but in Edison's prior application of March 5, 1898, referred to on page 2, line 2, of the patent in suit),

and the material being old, and the operation of casting being old—and indeed *the operation of casting this same old material in continuous cylindrical molds being old*—it is already evident that there remains only a narrow field for improvement in a “*process*” of casting records.

Novel Details Described in the Patent in Suit.

In the detailed description we note several particulars upon which stress is laid. The point to which greatest prominence is given is that the mold is *cold*, and that because of its low temperature, the contact thereof with the melted wax “will result in the *almost instantaneous* chilling of the material therein” (p. 2, l. 68, *et seq.*); and it is even proposed to use a mold that has been artificially cooled.

We have now arrived at the first recital of any peculiar or possibly novel feature in the process of casting. Bringing the melted material into contact with a *cold* surface so as to produce “the almost instantaneous chilling of the material” is a *definite procedure*, calculated to produce a *definite and characteristic result*. But this is *just the antithesis of defendant's process*, which requires that the material be not instantaneously chilled by contact with the mold, but *per contra*, that the mold and contents be heated to a higher temperature before cooling.

Thus we see that where Edison departed from the ancient casting method, he departed *in the opposite direction to that taken by Macdonald*. We will also see that, while the Macdonald process has led to industrial results of great magnitude and vast importance, the Edison process has led to nothing, and is industrially worthless.

Again, the patent in suit describes, as a feature of the

process, the introduction of the melted material in *an upward direction*, that is through *the bottom* of the mold. Complainant's expert, Mr. Dyer, says that this is important in order to avoid air-bubbles (C. R., p. 191, Q. 12); and Edison says that sound-records *cannot be made by casting the material into the top of the mold* (Id., p. 161, A. 123). Again we have a radical difference between Macdonald's practical process and Edison's theoretical one; for the defendant in making its sound-records, introduces the melted wax into the top of the molds.

The patent also describes, as a feature of the process, the removal of the core and the record from the mold, *before the core and record are separated*.

Defendant does just the reverse.

Incidental to the description of the casting operation it is said that—

"the material is allowed to cool until the solidified material has contracted away from the bore of the mold, so as to permit it to be removed therefrom" (p. 2, l. 93-97).

This contracting of the material is an incident of every casting process and a necessary result of the cooling of the wax-like material. It is not new, and, as already shown is simply a "fact" and is so stated in the specification, and not a step in the process.

The proposition is advanced by complainant that the patent describes a process which is new in that it specifies that the material, after it has congealed in the mold, contracts. This, however, is plainly the inevitable result of cooling, and cannot possibly impart the character of novelty to a process otherwise old.

Finally, the specification calls attention to the fact that, in consequence of the shrinkage which the records

undergo in cooling down to normal temperature, the spirals of the sound-groove draw closer together; and that it is hence "desirable" to allow for this shrinkage by making the spirals on the pattern (the original record) a little farther apart. An allowance of one per cent. for shrinkage is recommended.

It being common practice in the art of molding to make an allowance for shrinkage, so common that, to obviate the necessity of making calculations, "a shrinkage rule" is used for the measurements of the mold-pattern (D. R., p. 196), it was not necessary to point out the desirability of making proper allowance for the shrinkage. It would be understood by persons skilled in the art of molding.

The claims which defendant is charged with infringing are claims 1, 2, 4 and 5.

Claim 1.

Claim 1 reads as follows:

"1. The process of duplicating cylindrical phonographic records, which consists in first making an original record with a spiral record groove of greater pitch than that desired on the duplicate to be produced, then making a hollow cylindrical matrix or mold from said original record, carrying the record in negative on its bore, and in finally making duplicate records from the matrix by introducing therein and engaging therewith material maintained in an abnormally high temperature, whereby the cooling of such duplicate will contract the pitch of the record groove, as and for the purposes set forth."

This claim, while purporting to be a process of "*duplicating* cylindrical phonograph records," specifies an operation whereof the salient and supposedly novel fea-

ture is an alleged peculiarity in the making of the *original* record. The alleged peculiarity is not in the *process* of producing the original record, but merely in the pitch of the feed-screw of the recording machine on which the said original record is made. The *process* by which the original record is made is precisely the process by which all cylindrical sound-records have been made since the fundamental Bell and Tainter patent, namely by engraving in wax.

Having thus an original record (which is used as the pattern from which the mold is made) the claim simply specifies making a mold from this record and then using that mold in the way molds are always used.

Attention to this characteristic of claim 1 will enable the court to dispose of it without reference to the many other defenses. After pointing out how the original record is made, i. e., *exactly as original records had always been made* (but with the spirals of the record groove a little further apart than the spirals of an undefined ideal or "desired" record cherished in the mind of the operator), and after specifying the making of a mold from this record, the claim, which is for a process of making *duplicate* records, proposes absolutely nothing that has the pretense of novelty, for the words "abnormally high temperature" mean simply (as complainant's expert admits) "a temperature higher than that of the atmosphere" (C. R., p. 171).

Thus, on its face the claim proposes no new process of making a *duplicate* sound-record; and the recited peculiarity in making the original record (i. e., giving the record groove a greater pitch than that "desired" on the duplicate) is merely a recitation of what of necessity takes place when records (or other things) are cast from material which shrinks on cooling, namely,

the casting contracts. This is a law of nature, and the claim, while it certainly does not disclose a new process or tell us how this law of nature can be overcome, does at least embody a bit of philosophy. Mr. Edison, in this claim, drops the role of inventor for that of philosopher, saying "I cannot bend the law of nature to fit my *desire*, therefore I will bend in my desire to fit the law of nature."

The idea presented by this claim seems to belong rather to the realm of poetry than to that of invention. The object proposed in making these duplicate records is to mold them nearer to the heart's desire; as saith the oriental poet

"—couldst thou and I with him conspire
To grasp this sorry scheme of things entire,
Would we not shatter it to bits, and then
Remold it nearer to the heart's *desire*?"

In pointing out the palpable mistake in the claim in defining a change in the recording apparatus as a *process*, we are not simply taking exception to the form in which the claim is presented, although it would be a fatal mistake to claim, as a *process*, a change in an *apparatus*, even if that change constituted an invention. In doing what is specified in claim 1 there is no patentable departure of any sort from what previously existed. What the claim attempts to appropriate, however, is simply the resort to the common workshop of expedient of making allowance for the shrinkage which occurs in casting.

Claims 2, 4 and 5.

Claims 2, 4 and 5, constitute another attempt, of a different sort, to seize upon the occurrence of the inevitable shrinkage of the cast material as if it were a step, and a new step, of a process, and a step invented by Edi-

son. These claims attempt to cover, under the guise of a process, the broad operation of casting of sound-records in molds (claims 4 and 5 specify "cylindrical" molds) and the removal of the records from the mold after the inevitable contraction renders such removal possible. The manner of *removal*, specified as a step of the process, is the manner in which articles are ordinarily taken out of cylindrical molds.

It is evident from what has already been said that these claims, so far as they define any process of molding, define nothing new; and we will see that complainant attempts to sustain them, not by reference to novel features in the process of molding, but by reference to the continuity of the mold, or other matters distinct from the process of casting.

By the words used in these claims to describe the operation, namely,

"introducing a molten material in the mold,"
"allowing the molten material to set," "contracting the set material" and "separating the contracted molded material by a longitudinal movement,"

we are simply told to cast the material in the mold and, after it has sufficiently cooled and contracted, to take it out of the end of the mold. The claim then (for claims 2, 4 and 5 are substantially identical) is for the use of a continuous cylindrical mold in the only way in which such a mold can be used for casting a record; or (since casting tubular sound-records as well as tubular blanks in tubular molds was old) the claim is for *an alleged method of taking the sound-record out of the mold*, i. e., taking it out of the end of the mold (or as expressed in the claims, "*by a longitudinal movement*").

But we must also consider at this point Edison's application of two years previous, to which his patent

refers (application filed March 5, 1898). This earlier application is now patent No. 713209 (C. R., p. 334) and upon it is based the companion suit No. 1103. Turning to this earlier patent we find that the claims (2 and 3) upon which this defendant is sued, are for this same alleged method of removing the molded record from the mold, that is, "releasing the phonogram from the mold by a radial contraction of the phonogram sufficient to entirely clear the surfaces, and removing the phonogram from the mold by direct longitudinal movement" (Cl. 2, of Patent No. 713209). The patent in suit is, for present purposes, identical with this earlier application saving that, in the earlier application the record was to be molded by "pressing" (that is by expanding a solid blank in the mold) and in the patent in suit it was to be formed by "casting." To make a distinction then, we must hold, not only that to take a sound record out of the end of the mold in which it has been *cast* is an invention, but that it is a distinct and separately patentable invention from taking a sound-record out of the end of a mold in which it has been *pressed*.

Various Methods of Molding Records.

The testimony brings into view three general methods of molding sound-records, and it is important to recognize the distinctions between them. These three methods are known respectively as (1) "casting," (2) "pressing," (3) "dipping." In all three methods the mold is or may be an ordinary continuous cylindrical mold.

1. The "Casting" method consists in introducing the material in a *molten state* into the mold and allowing it to solidify in the mold by cooling, this being the common and ancient method of casting various articles. As the result of solidifying and cooling the record contracts, and can thus be withdrawn from the end of the mold.

The first molded records sold on the market were produced by the casting method, being made by defendant by Macdonald's process described in his patent No. 682991, September 17, 1901, as already stated.

Defendant's method is thus a *casting* method. The Edison patent in suit also relates to a *casting* method.

2. The "Pressing" method consists in introducing into the mold a *solid* blank cylinder (instead of melted wax), which cylinder fits the mold very closely, and then causing the blank cylinder to expand (as by heating it and driving into it a tapering mandrel) until it receives the impression of the mold. This process is described in patent to Edison, No. 713209, granted November 11, 1902, referred to in the patent in suit, and which is more than a year later than the patent in suit, *but applied for more than two years earlier than the application for the patent in suit* (C. R., p. 334).

This *pressing* method is not in use at all, and is not commercial. Edison's assistant Aylesworth, a very competent and intelligent man, says (C. R., 266, Qs. 128-130) that the pressing method does not result in a sharp impression, and that moreover, it causes an echo, or repetition of the recorded sounds (which, of course, is a fatal defect). Edison confirms this (C. R., p. 269).

3. The "Dipping" method consists in introducing a *cold* mold into a melted mass of wax, allowing it to remain until a sufficient thickness of wax, congealed by the low temperature of the mold, deposits on the inner surface thereof. This process requires that the mold should always be kept at a lower temperature than the melting point of the wax, and calls for special provisions to prevent a deposit of wax forming on the outside of the mold.

This dipping process is the process used by the com-

plainant. It was invented by Aylesworth and Miller, and is described in their patents Nos. 683615 and 683676, dated October 1, 1901 (D. R., p. 11, Q. 25 *et seq.*; C. R., p. 84, Q. 33 *et seq.*).

We thus see that the patents for the process which complainant uses issued *after* the Macdonald patents, and that, though the applications were pending simultaneously there was no interference.

It appears also that complainant uses for its records a *peculiar composition* (as already stated) very distinct from the ordinary phonograph wax (Rosanoff, C. R., p. 259, Q. 21; Miller, D. R., p. 9, Q. 6, *et seq.*; Aylesworth, Id., p. 13, Qs. 5-13).

This peculiar "duplicating wax" was invented by Aylesworth, and is preserved as a secret. The commercial results claimed by complainant are by Edison himself admitted to be due to Aylesworth & Miller's patented process and apparatus and to this secret composition (C. R., p. 144, Q. 43; p. 148, Q. 66; p. 157, X-Q. 104; p. 158, X-Q. 105).

It will thus be seen that complainant, by means of mere paper patents, is seeking to interfere with defendant's use of *its own patented invention*, which use was begun long before the patent in suit issued; and that the process which complainant itself uses is a peculiar dipping process, not invented by Edison at all. It was by these inventions of Miller and Aylesworth that the "enormous difficulties" which caused Edison in 1888 to put aside the casting process, and take up the pressing process, were overcome. Edison admits this in the answers cited above, as will be more fully pointed out hereafter.*

*While pressing these suits on Edison's paper patents complainant is holding back its suits in this court on the Miller and Aylesworth patents, in which it has taken no testimony at all.

General Considerations.

Inasmuch as the patent in suit is for a "process," it is important that certain fundamental matters relating to process patents should be understood at the outset.

The process which the patent describes is generically a "casting" process, i. e., it involves the steps of melting the material whereof the article is to be formed, introducing it into a mold, and allowing it to harden therein, and thus take the shape of the mold. This patent is not the first patent which describes casting articles in a mold, nor the first patent describing the casting of wax-like material into cylindrical forms for blank tablets and for sound-records for use in this particular art.

Inasmuch as *the novelty of a process must reside in the steps thereof* (and not in the instruments used therein or in the article made thereby) there can be no valid patent for merely melting wax, casting it in a mold, and allowing it to cool therein. This statement is necessarily true because the process thus defined is nothing more than the ancient and common process of casting.

The soundness of this proposition cannot be impugned, nor can its effect be avoided, by describing this ancient operation in unusual language, as if, for instance, instead of saying "pouring the melted material into the mold and *allowing it to cool therein*," we were to say "pouring the melted material into the mold *allowing the molten material to set and contracting the set material*." This latter expression does not define any different process from the former, because the "setting" (i. e., congealing) of the material, and its "contraction," are not *steps* of the process, but are the inevitable *results or concomitants* of cooling the cast article.

The two expressions are therefore descriptions in different words of *identically the same operation*.

It is important to avoid any possibility of being misled at this point, so we dwell for a moment upon it. The process of "casting" being well known, to say that an article is made by *casting*, describes all the usual steps of that operation just as clearly as if they were recited in detail.

Therefore, if one should propose the production of sound-records "by casting them in a suitable mold," we would unhesitatingly say that there is no novelty in this. The same conclusion would apply if, instead of the brief description of the mode of production as "casting," it were defined as "securing a suitable mold bearing a negative of the pattern desired on the casting, pouring the molten material therein, letting it cool until it sets and until it contracts sufficiently to permit its removal, and then removing it." We recognize at once that this is a mere amplification of the former statement, by reciting the usual steps and manipulations of the operation of casting.

We shall clearly see that claims 2, 4 and 5 of this patent, so far as they set forth a *process* (and so far as they set forth anything else we are not concerned with them), define nothing more than the process of melting the wax, casting it into a mold, and allowing it to cool, and thereby take the impression of the mold.

These claims, if construed as complainant desires, would cover, *any and every way* of producing sound-records by casting them in a mold. In other words, it would be impossible to cast sound-records without infringing these claims. Complainant's expert has endeavored to make it appear that the claims are not of such sweeping scope, and that they *do* leave open cer-

tain ways of casting records. Thus, he says that these claims cover only a process of casting in a *continuous* mold, and hence leave the public free to cast sound-records in sectional molds. But the same expert tells us that it is *impossible* to cast commercial sound-records in a sectional mold, so that, even were the claims thus limited to continuous molds, their scope would still be as broad as above stated. Moreover, as to this alleged limitation it is clear (1) that it is not found in any of the claims, and (2) that it can not be read into them because it does not apply to *the process*, but to an implement used therein. Manifestly the process of casting (i. e., certain steps pursued in a certain order) are not changed by changing the mold.

Again, the expert says that the claims are limited to a particular method of removing the record from the mold, to wit, to taking it out of the *end* of the mold (or, as expressed in the claims, removing it "by a longitudinal movement"). That limitation, however, does not really limit the claims, because, as is obvious (and as is stated by complainant's witness, Pierman), there is no other way of taking the cast article out of the mold. Moreover, the manner of removal of the article from the mold is not, and cannot be, a part of the *process of casting* it. That process is the same whether the casting be removed in one way or another.

Suppose we take one of the cylindrical molds put in evidence as an exhibit. It may be one that has a smooth inner surface, or it may be one that has fine lines (representing sound vibrations) upon its inner surface. These molds, just as they appear in evidence, are old; and the several special methods of making the sound-record mold are old and well-known. (Complainant has one way of making its sound-record molds, and defendant another.)

Having secured one of these molds, we melt and pour the ordinary "wax" into it, and let the wax stay there until it has become cold. What have we done? Clearly we have performed the usual operation of casting, which has been known for ages. In doing this we find, if we did not already know it, that long before the wax has cooled down to normal temperature, it has contracted so that it is smaller in diameter than the mold. This is an inevitable consequence of the cooling, since wax, in common with many other substances, expands and contracts as its temperature is raised and lowered.

Suppose now (the casting operation being *absolutely finished*) we lift the cast article out of the mold. We may safely assert that by this act (1) we have not practiced any "process" or part of a process, because we have not changed the article *in any way*; and (2) we have done nothing new, because that is the procedure whereby articles are *always* taken out of a continuous mold; and indeed there is no other way of getting them out. Yet it will be seen that, *upon this manner of taking the article out of the mold the supposed novelty of claims 2, 4 and 5 depends.*

It is admitted that defendant has a right to make and use molds of sound-records; but this patent seeks to prohibit defendant from removing the sound-record from the mold in the only way in which it can be removed therefrom.

In this general discussion we wish to state no consideration which is in the least degree doubtful, or which is reasonably open to dispute; and therefore we would dwell a moment on this question of the shrinkage of the wax in the mold to an extent sufficient to permit its withdrawal. It is true, and the patent in suit says so, that to carry out the process successfully we must

use a material which, upon cooling, will contract enough to disengage itself from the mold. (Spec., p. 1, lines 27 *et seq.*) Therefore, it might possibly require "invention" either to devise a composition of matter having a sufficiently high coefficient of expansion (if none existed), or to select from known mixtures, one having that property. But we need not discuss that possibility, because (1) the patent proposes no new material, nor even the selection of a special material; it recommends (p. 1, line 75) the use of the mixture described in Macdonald's 1898 patent, No. 606725 (Metallic soap and ceresin, D. R., 273), which is the composition defendant has used in making all its sound-records and blank cylinders for many years; and (2) in the case suggested the invention would be in a *new material or composition of matter, and not in a new process.*

Again, it is clear that whether, in the foregoing process, we have used a mold with a smooth surface, or one with a marked surface, *makes no difference in the process.* It is identically the same process, with the same result, namely, the production of a cast article having on its surface the impression of the bore of the mold.

This proposition is sufficient in itself to dispose of the case; because *continuous cylindrical smooth-bore molds have been used for fifteen years for the casting of sound-record cylinders.* In this old operation of making blank cylinders, we have the same implement (a continuous mold), the same material (wax-like recording composition), the same process (melting and casting in the mold), and even the same manipulation (withdrawing the cast article by a direct longitudinal motion).

The anticipation of the claims in suit by the old operation of casting sound-record cylinders will be fully

discussed in an appropriate place (see p. 52, *infra*). At this point we will only glance at the attempted reply, which is twofold—(1) that the casting of a blank cylinder is a different process from the casting of a sound-record; (2) that in casting blanks the cylinders are usually wrenched forcibly out of the molds before they have contracted materially and are afterwards shaved to give them a smooth surface.

1. A blank cylinder is a different *article* from a sound-record in that the one has a smooth surface and the other a marked surface. But if the smooth cylinder is made by casting, and the rough cylinder is also made by casting, it is a self-evident proposition that both are made *by the same process*. It does not make even a new use of a process (much less a new process) to apply the *product* thereof to a different use from the customary one. For example, if we have been casting glass tubes to be used as pipes, and begin to cast glass tubes to be used as lamp chimneys, we have not changed *the process*, even if the lamp-chimney molds have a pattern traced on their inner surface, instead of having a smooth surface.

In a word, this reply does not so much as *assert* a change of process, but asserts only a difference in the article made thereby; and it does not in reality assert even a difference in the article, since the same material is used in both cases, and it is cast into the same cylindrical form, in continuous cylindrical molds. The difference is one in the markings *on the mold-surfaces*, which surface is, in both cases, impressed upon the cast material.

2. It is not true that blanks have always been wrenched out of their molds before contraction begins. Complainant's witness Aylesworth says that complainant did not

begin the practice of withdrawing the blank from the mold while hot and semiplastic *until about 1895* (C. R., p. 120). This same witness testifies as follows (p. 133) :

"111 X-Q. Among the methods of making blanks with which you have been familiar is one which consists in pouring melted wax into a continuous cylindrical mold, allowing the wax to solidify, and then removing from the mold by withdrawing it longitudinally.

"A. Yes."

Complainant's witness Pierman testifies as follows (p. 24) :

"94 X-Q. Do you know of your own knowledge and experience that the material of which sound-records are made *contracts on cooling after having been melted?*

"A. Yes.

"95 X-Q. How long have you known that?

"A. *About 1½ years.*

"96 X-Q. Did you observe that from seeing this material cast in molds and being familiar with its behavior?

"A. Yes, sir; I did.

"97 X-Q. That has been a matter of common observation and knowledge for many years, has it?

"A. Yes, sir.

* * * * *

"100 X-Q. Have you ever seen any molded objects other than sound-records made in and removed from a cylindrical mold?

"A. Yes, sir; I have.

"101 X-Q. When the mold is a continuous one do you know of any other way of taking out the molded object except by withdrawing it longitudinally?

"A. No, sir; I do not.

"102 X-Q. How long have you known of the use of cylindrical molds in the talking-machine art?

"A. *About ten years.*

"103 X-Q. And the article cast in the mold has

always been removed by withdrawing it longitudinally, hasn't it?

"A. I believe it has."

Defendant's witness Cameron (D. R., p. 31) testifies that it has long been common to cast blank cylinders in continuous molds, allow the cylinder to harden and contract, and then withdraw it lengthwise; and he cites *patents of Edison, which describe that very operation.* (Id., pp. 30, 31.)

Macdonald (D. R., p. 52) testifies that he has been familiar since 1889 with the operation of casting wax cylinders in continuous molds (Q. 8); that when the wax cooled it dropped out of the mold quite easily (Q. 9); that defendant has manufactured blanks in this way almost continuously since 1891, and continuously since 1894 (Q. 13-16, p. 53).

Hence we have, in the long practiced method of making blank cylinders, *the identical process* set forth in the claims here sued on, when those claims are so broadly construed as to embrace defendant's process.

It may well be that the process practiced in making blank-cylinders would require modification in some details before it could be *successfully* used for the manufacture of sound-records. If so, there would be room for improvement in the process. Indeed *such improvement was necessary, or at least desirable.* Every one agrees that, to avoid air-bubbles and to get a faithful impression of the mold, some improvement was desirable. That being true, it is evident that the patentable invention would consist in the *new means* whereby difficulties were overcome and benefits accomplished. It is a self-evident proposition that, even if Edison invented new improvements which permitted the old process to be practically employed for the manufacture of sound-

records, his patent must be confined to the *new improvement*, and cannot embrace broadly the old process.

It must always be open to others to use the old casting process, so long as they do not use the new improvements.

We submit, therefore, under this heading that the process of casting a sound-record by introducing melted wax into the mold and, when sufficiently cooled and contracted, taking it out of the mold by a longitudinal movement, is the same process as that long used for making sound-record cylinders by introducing the same melted wax into the mold and, when sufficiently cooled and contracted, taking it out of the mold by a longitudinal movement.

The State of the Prior Art.

We have already made a general reference to the state of the art antecedent to defendant's adoption of the plan of casting sound-records, and antecedent to the Edison patent in suit. Before proceeding with the discussion of the questions of patentability and infringement, it is desirable to call attention to a few other pertinent matters.

Edison's British patent No. 1644 of 1877 (C. R., p. 370-372), referred to by Mr. Dyer on page 206 as containing some of Edison's "dreams and hopes of twenty-five years ago," proposes making a cylindrical mold and casting a sound-record therein (the mold being in two parts).

Edison's U. S. patent No. 200521, dated Feb. 19, 1878, says that a record may be stereotyped, and multiple copies made expeditiously and cheaply "by casting" or by "pressing" (see quotation on p. 205, C. R.).

Manifestly, this brief statement discloses the entire subject-matter of the claims involved in this suit, it be-

ing understood that "casting" means melting, pouring, cooling (and consequent shrinkage) and removal from the mold by a longitudinal movement when the mold is of the continuous cylindrical form.

Then comes the Edison 1892 patent (hereafter discussed in detail), which describes the method of making a mold by vacuous deposit, and its use for casting sound-records, suggesting that the mold be divided into sections to facilitate and expedite delivery of the casting. (D. R., p. 190.)

Then we have Lioret's U. S. patent No. 528273, dated October 30, 1894 (D. R., p. 250 *et seq.*), and Young's British patent No. 1478, January 23, 1894 (D. R., p. 295), which have an important bearing on the case.

Lioret U. S. patent No. 528273, Oct. 3, 1894. (D. R., p. 250.)

This patent is useful in that it saves the necessity of arguing that it required no invention in casting sound-records to shrink the record loose from the mold. The patent describes (*inter alia*) molding sound-records in *continuous* cylindrical molds (Figs. 5 and 6). The use of the mold for making celluloid records is thus described (p. 258, l. 98) :

"I introduce into said tube a sleeve or ring *c* of celluloid (see Fig. 7) just large enough to enter it freely, then plunge the whole into hot water. The celluloid is thus softened, and I then introduce forcibly into said collar or ring *c*, a mandrel *a*², sufficiently large to dilate the said ring or collar and cause it to penetrate into all the cavities of the mold *a*' as shown in Fig. 8. *I then plunge the whole into cold water and the celluloid recovers its hardness and is at the same time generally contracted sufficiently to permit the easy withdrawal of the ring c from the mold a' by unscrewing it therefrom.*"

Lioret's mold has the sound-groove at the bottom of a spiral thread in the mold, instead of on a plane surface, and hence, after the record is shrunk loose from the mold, the former is withdrawn by an unscrewing movement. It is obvious, however, that the idea of shrinking the record loose from the mold is fully disclosed in this patent, and that to substitute, in the Lioret process, a mold of the usual type for that described by him would not affect this part of the manipulation. The patentee says:

"It may be mentioned here that the *impression produced by the style on the matrix cylinder*, and reproduced in reverse in the mold *a'* is so slight that only a very slight dilation of the ring *c* is necessary to obtain the impression on it, and a *very slight contraction* to permit it to be unscrewed from the mold *a'* without damaging said impression.

"It may be further mentioned that the threads of the matrix are very fine in practice and are very much exaggerated in the drawings to facilitate the illustration."

In view of this patent it is clear that there was no novelty after 1894 in the idea of shrinking a sound-record out of the mold in which it was made.

Following this invention of Lioret came Young's British patent No. 1478, January 23, 1894 (D. R., p. 295, *et seq.*). Young acknowledges Lioret's prior British patent (see p. 301, l. 15) and (disclaiming what is therein set forth) describes a method of duplicating records by coating an original wax record with plumbago, depositing metal thereon by electro-deposition to form a *continuous mold*, and molding records therein by introducing a thin cylinder of celluloid or like material, softening by heat, and expanding it against the mold, cooling the plastic cylinder and then collapsing and

withdrawing it longitudinally. To quote from the specification (p. 3, last line):

"When the said plastic cylinder has cooled I am enabled, by slightly collapsing this inwardly, to cleanly and easily remove it from the electro, when I am in possession of an exact duplicate of the original record," etc.

Here then, we have the use of *continuous* cylindrical molds for making sound-record with every idea or mode of manipulation which the Edison patent (in the claims sued on) suggests.

If it be said that the Edison 1892 patent (split-mold) left the need of an "invention" to return to the use of "continuous" cylindrical molds, this suggestion was supplied by Lioret and Young, the former describing the release of the record by shrinking, and the latter pointing out that the plan of slightly collapsing the record may be resorted to.

Obviously there could be no invention in substituting for celluloid, xylonite, etc., as proposed by Lioret and Young, the ordinary sound-record compositions already in use in the art, and having a coefficient of expansion sufficiently great to render the collapsing of the record unnecessary. Removal by a "direct longitudinal movement" is described by Young. These patents, therefore, disclose clearly the idea of shrinking a record within a continuous cylindrical mold, and withdrawing it lengthwise. They leave no possible room for invention in the claims involved in this suit.

Edison patent No. 382417, May 8, 1888. (See D'ft's Rec. in the companion suit No. 1103, p. 283.) This is an important patent as showing the early use in the talking-machine art of cylindrical molds, both continuous and sectional, for molding wax record cylin-

ders *both by casting and by pressing*. In describing the making of the blank cylinders the specification says:

"The mold is swung to the left over the solid part of the base, and the core being placed in it and the mold closed, hot wax is *poured into the mold*, forming a cylinder around the core E."

This is clearly the first part of the process recited in claims 2, 4 and 5. For this part of the process it is proposed to use a two-part mold. The description continues:

"When the wax is partially cool, *sufficiently so to retain its shape*, the mold is swung to the right over the opening D and the core E is pushed down into the opening D, as shown in Fig. 2, *thus permitting the wax to contract without breaking*. After the cylindrical blank has cooled down to a temperature where it is still slightly plastic it is *removed from the mold*, and is placed in the die F."

This blank cylinder, before it has cooled down to normal temperature, is now inserted in another mold (herein called a "die") "*which may be a divided die or one that is solid*." It is then *expanded* so as to take a perfect impression of the surface of the die, and is then removed. This last operation (expanding and removal) is the process (claims 2 and 3) of the Edison patent No. 913-209. The molded article is, of course, removed from the mold (or die) by a longitudinal movement.

Appelt's patent No. 303970 (D. R., p. 203) describes the casting of rollers in a cylindrical mold, and allowing the material to congeal

"when the roller will easily come out of the tube *a* in consequence of *the shrinkage* which all compounds composed principally of gelatine and of glycerine undergo."

Day's patent No. 563572 describes the same process of casting an article (printer's roller) in a cylindrical mold and shrinking it out. For the latter operation the patentee allows

"cool air to circulate through the interior of the mold, thereby drying the tubular roller, causing it to shrink at the inner surface and withdraw itself from the outer tube C, when it may be removed from said tube," (lines 79-84).

These patents clearly describe the identical process of the claims sued upon.

Finally, Edison's patents No. 406576, July 9, 1899 (D. R., p. 241) and No. 382462, May 8, 1888 (D. R., p. 231), refer to the expansion and contraction of wax-like materials. No. 406576 specifically refers to a compound "which shrinks slightly in hardening, and can, therefore, be readily removed from the mold." (See Mr. Cameron's testimony, D. R., pp. 30, 31.)

History of Edison's Experiments.

Edison testifies that he first tried to mold duplicate records about the year 1878. The material employed was plaster of paris, and, of course, he used a split mold. He says he took up the subject again in 1887, at first using split molds, but that "afterwards in 1888 we abandoned split molds." He did this because he found that "with certain materials" he could take advantage of the contraction of the materials, and was thus able "to pull the record out longitudinally without scratching the surface." (C. R., pp. 137, 138.)

The attempt to use split molds was entirely laid aside in 1888, twelve years before the application for the patent in suit, and four years before the "split-mold" patent was issued (p. 140, Qs. 15, 16, 17).

We ask the Court to note particularly that, if Edison "invented" the process of taking a sound-record out of a mold by withdrawing it after it has sufficiently cooled, he made that invention in 1888, twelve years before the application for the patent in suit.

And when asked what change in the conditions led to the abandonment of the split molds (5 Q., p. 138) he says:

"To the discovery that there were certain materials that would shrink enough so that we could pull the record out longitudinally."

Thus it clearly appears at the outset of Edison's deposition that the transition from split molds to continuous molds occurred twelve years before the application for the patent in suit, and that *it was not the consequence of any discovery of a new process*, but admittedly was due simply to finding that certain materials "would shrink enough so that we could pull the ~~materials~~ out longitudinally."

record

It is, moreover, clear, without this admission, that if any discovery was made at this point it was a discovery relating to a new composition of matter, and not to a process. Edison admits this at several places in his deposition, as we will see. The only change of procedure here indicated was that which is incidental to the use of a continuous mold, namely, taking the record out of the end of the mold—no other way being possible.

On Edison's own account of it, shrinking out the record (as distinguished from opening the mold to deliver it) was not the discovery by him of a new *process* of removing a cast sound-record from a mold, but was something which it was possible to do "with certain materials." The new invention, if any, was not a *process* but a composition of matter.

Not only was the use of split molds entirely abandoned in 1888, but *the casting method was discarded in that same year.*

On October 26, 1888, Edison filed a caveat for the "pressing process," which Edison says gave "very much better results than that obtained by the casting and chilling process" (p. 139, 8 Q.). We can judge what results were obtained at that time by the casting process, from the fact that the pressing process, which gave "*very much better results*" is not a good process to-day (Aylesworth, p. 266, Qs. 128-130; Edison, p. 269, Q. 129).

After this we hear no more of the casting process. Edison shows that it was the "pressing" process, which occupied the stage (p. 141, Q. 21; p. 143, Q. 37; p. 143, Q. 39). He explains why he did not use the casting method "at that time" (p. 144, Q. 40), and the context shows (see pp. 142 and 143, Q. 32 *et seq.*) that he is referring to the entire period from 1888 on; and in answer to Q. 41, he says that answer 40 refers to "*all during the period when we dropped casting for the pressing method.*"

During all this period there existed difficulties in the way of casting sound-records, the difficulties being due to

"impure materials, production of gas-bubbles, the sticking to the mold, and *innumerable other defects.*" (Q. 40.)

Hence the casting process was discarded for the "pressing" process, in which a *solid blank* is used.

The caveat of October 26, 1888, shows when this period during which the casting process was dropped ~~period, during which the casting process was dropped,~~

At that time, and until June, 1891, these experiments

began

were conducted by one Schulz-Berge, whose note books have been put in evidence. They show the use of the pressing process. (C. R., p. 123, Q. 64.) One entry dated October 8, 1890 (Aylesworth, p. 124, Q. 67), contains the words "cast cylinder without pressure," and speaks of "brown filling wax." The entry also contains the words "dipped and pressed." Aylesworth thinks this meant an attempt to cast a record, but says that "the success of the experiment was not good."

Wurth, whose knowledge of the process used at the laboratory began in 1894, describes the pressing process as the one he then saw in use (p. 38, Q. 32). He makes no mention of casting.

The period during which the casting process was dropped extended to *about or subsequent to the time the application for the patent in suit was filed, i. e., about May, 1900.*

As to this Edison testifies (p. 157):

"105 X-Q. You say that you dropped the casting process and took up the pressing process until you reached a point in the art where the defects of the casting process were overcome. When was that point reached in your opinion, or according to your recollection?

"A. Well, I think—I believe it was somewhere about the date of my application on this casting process we got to a point where we were pretty near being able to compete with the mechanical process."

It must not be supposed from this that Edison took up and improved the casting process even at this late day (which is long after Macdonald's invention). He is frank enough to say that the progress in casting was due to the inventions of Aylesworth and Miller. In the

same answer quoted from above he says that at the time referred to

"it got so far that I suggested to the National Phonograph Company that they better get Aylesworth and Miller to go ahead and get it down and see how far they could carry it and reduce the discards and make it commercial, and then I dropped it and gave it all over to those two experimenters."

Thus we have it upon Edison's own word that he dropped the casting process for a long stretch of years, during which he was occupied with the pressing process; that he took it up again sometime in 1900, *not to do anything with it, but merely to turn it over to Aylesworth and Miller, and immediately drop it again.*

The pertinent fact then is that when Edison dropped the casting process for the pressing process in 1888, *he dropped for good and all, and never resumed inventive work upon it.*

This is not in conflict with his statement (p. 140, Q. 18), that work with the casting process "was quite extensive in 1888, and the experiments on that process of casting have continued *on and off* ever since 1888;" because he does not say that the subsequent experiments were continued by him, nor is any date assigned to them. "On and off" has a wide latitude of meaning.

Now, in what state were Edison's experiments in casting sound-records when he dropped them in 1888?

We have already quoted Edison's statement of some specific defects and "innumerable other defects" (Q. 40). Again, in answer 18 (last quoted from above), he says (speaking of claims 2 to 6 of this patent, i. e., "casting the duplicates and shrinking them out of the mold").

"It was an ideal method, but there were enormous difficulties in the way."

This is a very clear statement of what the court has doubtless perceived already, that shrinking a sound-record out of the mold is not a process, but a result aimed at, a thing *to be* accomplished, an "*ideal*," requiring means to be invented in order to overcome the "enormous difficulties in the way."

This is one of the many reasons why the claims are void, as will be shown later on.

In answer to X-Q. 102 (p. 157), Mr. Edison states what the enormous difficulties (or some of them) were. He mentions air-bubbles, unequal shrinkage, and "a great number of troubles" unspecified. We are quite willing to admit that the difficulties were serious. In this answer Mr. Edison includes as another drawback "our ignorance and lack of knowledge." Doubtless during all this period Mr. Edison discovered things which were *new to him*, but not new to skilled molders, such for example as the expedient of allowing for shrinkage.

It becomes then important to inquire when, and by what means, these "enormous difficulties" were overcome. We invite special attention to this testimony.

Edison admits, as we have already shown, that the transition to a continuous mold was due "to the discovery that there were certain materials which would shrink enough so that we could pull the record out longitudinally without injuring it."

This must mean the general class of metallic soaps, and in this respect his statement conforms to the testimony of Cameron, Macdonald, Pearman, Miller and other witnesses, who testify to the well-known shrinkage of these wax-like materials.

But, if Edison's testimony means anything, it means that after finding out that these materials would shrink

enough to clear the mold the "enormous difficulties" still remained, for he abandoned all attempt to cast sound-records, and took up the pressing process.

Obviously, if the advent of metallic soaps with their high coefficient of expansion solved the difficulties in the way of casting sound-records, that solution has been a matter of public knowledge for fifteen years. Moreover, if these materials were the new means which overcame existing difficulties in the way of this "ideal method," the invention (if any) was clearly not a process, but a material, and if not already patented cannot be patented now. Finally, it is obvious that in this event Edison would not have waited twelve years before filing an application for patent, particularly as he filed a caveat for his pressing method in 1888, renewed the application for his casting process (split-mold) in 1892, and filed an application for patent for the pressing method in March, 1898. (Patent No. 713209, C. R., p. 334.)

What then were the means which overcame the "enormous difficulties" which stood in the way of the "ideal method" set forth in claims 2, 4 and 5 of the patent in suit?

This is a vital question, because the means which accomplished this would constitute the patentable invention, if any.

Again we ask particular attention to the proposition here involved, for it is decisive of this case. The situation is this: In 1888 Edison attempted to do a certain thing, i. e., to cast sound-records in a cylindrical mold. (He had already discarded the idea of using split-molds so that we can ignore that apparatus.) It either did or did not require a new invention to do this. If invention

were needed it might be an improvement in the mold, or in the material, or in the process of using the old mold and old material. One thing is *certain*, the invention could not consist broadly in the old method of using a continuous mold, because that would be equivalent to saying that no new invention was required. What then *was* the new invention (if any), who made it, and when? We will take Edison's testimony for this.

On pages 156 and 157 he is cross-examined regarding the "enormous difficulties" referred to by him, and the means whereby those difficulties were overcome. The following are the pertinent matters:

Answer to X-Q. 98 (p. 156) shows that the materials which were discovered, and which shrunk enough to enable them to pull the record out of the mold *are not described in the patent in suit; because, with that very patent before him, he cannot mention any of those materials*, replying,

"Well, I would have to look up my note book."*

Asked in what particulars the process he is using today differs from the process as he had it in 1888 (X-Q. 101), all he can say is:

"A. Well, very little. *There is a different material used that has very good properties and produces few discards and gives off very little gas.*"

And he describes another difference in that the new process does not use a core in the mold.

Asked again how he overcame the enormous difficulties (X-Q. 103), he says:

*This fact has another important bearing on the case, showing either that the specification of the patent in suit is fatally defective, or that the 1892 patent discloses all that was needed to practice this process.

"Well, as time went on we found out the cause of all these different troubles. We kept getting *better materials*, and getting conditions whereby we could avoid them, not pouring the materials so hot, and cooled them down to different stages, so that these decomposition products which gave gas would cease to give them off, and those things which experience gives."

No new means are referred to, except better materials. This is made very specific in the next answer. We quote the question and answer in full:

"104 X-Q. Did you find any particular composition or compositions which avoided or diminished these difficulties?"

"A. No we never got rid of them entirely so that but what the discards would be very great with the casting process up to the time that Mr. Aylesworth got his material. The discards by the pressing process were very small, and we put all our work on that to the exclusion of the other, although at times we would go at it and try it. I would take it up and then I would drop it and take it up again, because it was the ideal method of doing it. It is a very difficult—the casting process is a very difficult proposition, as all will find out that try it."

This is conclusive, showing that the means which overcame the difficulties (or contributed largely thereto) was a material invented by Mr. Aylesworth, and which (as the testimony shows) *complainant keeps as a secret*.

Complainant's counsel made a strong effort to extract from Mr. Edison some statement which would support the proposition that this patent covers (in the claims

sued on), a new invention. This effort begins with Q. 65, on p. 148, where his counsel asks him this crucial question:

"65 Q. What then do you regard as the elements or conditions which made it possible for you to successfully shrink out the duplicates from molds of the standard length like 'Complainant's Exhibit Record Mold of 1897?' "*"

The witness in his answer says that these elements or conditions were:

(a) that it (the original record) had a coarser pitch; (b) that the sounds were very much louder; (c) that the distortion was not so noticeable though sometimes there was an echo.

This is a most extraordinary answer. The inventor, who claims to have made an invention which overcame certain difficulties is asked how he did it, and this is all he can say about it!

His counsel makes another effort:

"66 Q. What *other* conditions made your shrinkage out of the continuous molds a possibility?"

(There is a delicate irony in the use of the word "other," as certainly no conditions have yet been mentioned by the witness.) But what a remarkable question! The shrinkage of the record out of the mold is claimed as an *invention*, i. e., as a new means of accomplishing a result, and yet the inventor's counsel asks him, What conditions made it a *possibility*? This is a clear

*Mr. Dyer unconsciously recognizes that the shrinkage of the record was not a process performed on the subject-matter, but an end to be accomplished, i. e., rendered possible.

(though unconscious) admission that shrinkage was not a new process, but a desired result.*

Mr. Edison's answer is:

"A. Another condition was that *Messrs. Aylesworth and Miller had produced a material which had the very fine properties for the purpose.*"

Mr. Edison here states again that what rendered the shrinkage out of the records "*a possibility*" was an invention made by Messrs. Aylesworth and Miller.

Of course, this fact, if it be a fact (and who shall contradict the patentee himself), is an end of the matter. To claim, in 1900, that shrinking a cast sound-record out of a mold is a patentable invention, is presumptuous enough, but to justify it by the statement that this result was rendered a possibility by a discovery *made by some one else*, is astounding. Of course, Mr. Edison's counsel could not leave the matter there, so he made the situation worse (if that were possible) by the following:

"67 Q. I am referring to your inventions set out in the patents in suit, one feature of which is the shrinking of a duplicate out of a continuous mold. Now I want to know what the conditions are which enabled you to successfully shrink duplicates out of continuous molds of standard length which are covered by those patents?"

"Objected to by defendant's counsel, this question having been twice asked and no reason appearing for believing that the witness has not truthfully and fully answered it.

*See p. 83, *infra* for the distinction between the idea of a *result* to be accomplished, and the idea of *means* for accomplishing it.

"A. Well, I should say that the conditions were, the fact that you could shrink the record out to such an extent that it could be removed without obliterating it; secondly, the production of a very fine matrix; and thirdly, the making of a matrix and determining beforehand the necessary change in pitch of the screws, so that the end result should be a record which would go on the standard phonographs then in use; and I might add, the instrumentalities for casting and the manipulations connected therewith."

The only condition which this answer adds to the previous answers is "the instrumentalities for casting and the manipulations connected therewith." Inasmuch as the instrumentalities used by the complainant are those of the Aylesworth and Miller patent No. 683-676, and the manipulations are those of their patent No. 683615, we have a full confession from Mr. Edison that he is attempting by this patent in suit not only to claim a *result* under the guise of a process, but is claiming a result which was realized by the inventions of others, a part of which are described in patents granted to them, and part kept as a secret by complainant for its own exclusive benefit.

Summing up the testimony regarding Edison's attempts to mold sound-records, we find that he sought in 1888 to cast records, and to shrink the castings out of the mold; that, not succeeding, he dropped the casting process for the pressing process; that he never took up the casting experiments (unless to drop them again) and that the commercial results obtained by complainant were secured by inventions of Aylesworth and Miller.

The Vice of the Claims in Suit.

The claims sued on have a vice which is common to all of them, namely, that they attempt to seize upon a necessary incident or result of cooling (to wit, solidification and shrinkage), and treat it as if it were a step in or part of the process, i. e., an act or operation performed by the inventor upon the material.

Manifestly it does not make a new process to add to a description thereof a statement of what inevitably occurs when the steps of the old process are practiced. Since the waxy material inevitably solidifies and contracts upon cooling down from the melted condition, it adds nothing to a description of the ordinary casting operation to say that the wax, when cold, shrinks to its normal bulk.

The absurdity of claiming *the shrinkage*, as if it were an operation that Edison performed upon the material (as is attempted by claims 2, 4 and 5), and of claiming *making allowance for the shrinkage* (as attempted by claim 1), is most strikingly exhibited by the testimony of complainant's expert.

It was brought to his mind that, anterior the alleged invention of claim 1, sound-records were made in molds obtained from original records having 100 threads of the record-groove to the inch. We will call this, for short, a "100 pitch" spiral. He is then asked, can the process of claim 1 be practiced with a mold having a 100-pitch spiral (C. R., p. 213, Q. 33). He replied (as he must) *certainly not, "because that is the very thing that was done before the invention of the first claim."*

He also admits (as he must) that so soon as one alters the pitch of the feed-screw of a reproducing ma-

chine so that the product of such a mold can be reproduced conveniently upon it, the use of that 100-thread pitch mold *would* infringe the claim (p. 213, X-Qs. 36-38).

In other words the expert admits that the use of a 100-pitch mold *cannot possibly infringe this claim, because that is just what was used before*. Nevertheless, he says that if a slight change were made in the *feed screw of a reproducing phonograph*, that which could not possibly infringe the claim *would* infringe it.

Such a claim as this was probably never heard of before. There is no precedent for it. A prime requisite of a claim is that it shall be *definite*. There never was a *valid* process claim whose meets and bounds were not fixed by its own terms (aided if necessary by the specification), and to ascertain the meaning of which it was necessary to know what pitch of feed-screw happened to be in fashion at the moment; and never any claim, valid or invalid, which could be made by a slight change in existing machines *to cover exactly what was done before its subject-matter was invented*.

To carry this curious state of things to its conclusion we must consider the infringement of this claim. Complainant's contention is that the invention lay in allowing for the shrinkage of the record, so as to avoid the necessity of making any changes in the *machines* (see X-Q. 40, p. 215). If the pitch of the record did not correspond with that of the machine, a change *in one or the other* was obviously necessary. Mr. Dyer says it was a "brilliant" idea to think of making *the record fit the machine*. It required an inventive genius to do that. An uninspired mortal would only be equal to thinking of *changing the machines to fit the record*.

Now, accepting this view, it clearly means that what the claim covered was the idea of making such a change from the existing 100-thread pitch in the mold that the resulting product would fit existing machines. What *it left open to the public was the alternative of changing the machines to fit the product of the 100-thread mold.* But we find that, if one choses this alternative (*which he is perfectly free to do*), he at once falls within the claim because, in exercising his freedom to alter the machines, he has produced a type of reproducing machine with a 101-thread pitch, and since the 100-thread mold is coarser then this standard machine, he infringes by using the old 100-thread mold.

Our language does not contain words which fitly describe the superlative absurdity of this claim.

When we turn to claims 2, 4 and 5, we find a situation scarcely less absurd. In them Edison does not claim doing something to offset or prevent the inevitable shrinkage, but actually claims the shrinkage itself, as if it were a new property which he had imparted to a material which was by nature unshrinkable.

It is clear from the considerations stated under this heading that these claims do not cover patentable processes, because they do not specify any new acts or operations performed upon the subject-matter. So far as acts or operations are specified at all, they are merely those which were old and common in the casting of articles of various sorts. The particular occurrence relied upon to give novelty to the claim, namely the *shrinkage*, is not an act performed by the operator, but an inevitable result of cooling.

This proposition will now be further considered in connection with the authoritative definitions of a process.

The Claims Do Not Define a Patentable Process.

In the statutory division of patentable subject-matter (4886, R. S.), provision is made for the grant of a patent for the invention of "any new and useful *art* * * * or any new and useful improvement thereof," and it was long ago settled that an improvement in an industrial "process" is patentable under this head.

The Supreme Court has given explicit definitions of patentable processes, in some cases drawing a very sharp line. We need not, in this case, pay attention to the nice distinctions. We need only keep in mind two restrictions which are well understood, namely (1), that a process must be something distinct from the function of the apparatus used in carrying it out; and (2) that the process resides in the steps performed, or acts done to the material, and not in the *effect* produced.

"A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts performed upon the subject-matter to be transformed and reduced to a different state or thing." (Cochran v. Deener, 94 U. S., 780.)

This is the most comprehensive definition of a process ever given by the Supreme Court, and is accepted as both authoritative and accurate.

It is therefore, a "process" to treat a wax-like composition and, by performing on it an act or series of acts, to transform it into a sound-record. Obviously the process begins where the treatment of the subject-matter begins, and it ends where the "given result" is produced.

Considering claim 1 of the patent, we find that it really includes three distinct operations, first the operation of making an original record; second, the operation of making a mold, and third the operation of making

a sound-record in the mold. The making of the mold has absolutely no relation to the making of the record, the mold (however made) being simply an implement used in the process of making the record. The making of the original record is merely the making of the pattern from which the mold is produced.

Hence, the only act performed on the subject matter (sound-record material) according to this claim, is bringing it, while heated, into contact with the mold, and then cooling it, whereby it contracts. This act being old, there is nothing patentable in the claim.

Moreover, it is expressly admitted in the patent in suit that the manner of making of the mold is old, being precisely that described in the 1892 patent. Therefore if claim 1 states anything patentably new, it is not an improvement in a process of making sound-records, and the claim is invalid.

Claims 2, 4 and 5 also fail to respond to the test of this definition. It is admitted that the steps whereby the record is made (i. e., melting the wax, casting it in the mold, and cooling) are the steps of the ancient operation of casting, and are not patentable. These claims depend for their novelty upon the recitation of the fact that the material contracts, and upon the mode of removal of the record from the mold. The contraction is not an act performed on the material, but is the result of cooling; and the removal of the record from the mold is not an act performed on the material, and is not a step in the process of making the record. It does not transform it into a different state or thing, or affect it in the slightest degree. The article is complete before it is taken out of the mold.

It is in the highest degree preposterous to assert that, if a person be free to cast a record in a cylindrical

mold, he becomes an infringer by withdrawing it from the mold in the manner which (as complainant's witness Pierman says) is the only way of removing it; and as has always of necessity been done in using continuous cylindrical molds.

The force of this objection is more clearly recognized when we consider the second principle stated above, namely, that a process must be "a mode of treatment to produce a given result," and not the result itself. We see at a glance that the taking of the record out of the mold depends upon the "contraction" of the record. Now contraction might be a step of a patentable process if it were "an act performed on the subject-matter," or a "mode of treatment." It is, however, merely the "result" of the cooling of the material, as Mr. Dyer admits. (C. R., p. 238, X-Q. 105, 106.)

In 122 Fed. Rep., p. 82, we find a case which illustrates this point. The patentee there claimed a water meter wherein certain parts had a larger coefficient of abrasion than certain other parts, instead of claiming means whereby the indicated results were attained. (National Meter Co. v. Neptune Meter Co.) The court held that these claims were: "Very highly and broadly generalized, laying them open to the charge that they attempt to patent a *mere result* or abstraction, rather than a *specified means for accomplishing it, which is alone patentable*. *O'Reilly v. Morse*, 15 How., 62."

We are dealing in the case at bar with a more gross and obvious violation of this principle; for the claims of the meter case *did* purport to define some new means, whereas the claims of the case at bar are for nothing more than the old steps, melting, casting and cooling, with a recitation of the *inevitable results of the last of these steps*, namely, the contraction of the cast article.

Another view of these claims which brings us to the same conclusion (thereby confirming it) is that they attribute to a *process* what is really but a property of the *material*. The use of the phrases "allowing the material to set" and "contracting the material" suggest things done to the material, and in that respect are misleading. Of course, to be a patentable process the things done to the material must be *new*. But in this case the specified things are not acts performed on the material at all, and therefore do not constitute a process *of any sort*, patentable or otherwise. Melting a material and allowing it to become cold again is a process (though not a *new* process), but "setting" and "contracting" are not things done to the material, but simply the inevitable accompaniments or results of cooling.

The claim could be paraphrased by the statement "melting a material having a coefficient of expansion great enough to shrink clear of the mold upon cooling, pouring such material into the mold, and when the article has cooled off, taking it out." So stated it would be seen that the described operation is not new, and not a patentable process, the only specified peculiarity being in *the properties of the material used*. Yet it is perfectly clear that this statement means precisely the same thing as the claims under consideration.

This property of shrinkage was a matter of common knowledge from the beginning. Pierman (complainant's witness) has known it since 1888, and so have others. The shrinkage, therefore, not only is not a step of a process, but is *not new*.

**Anticipation by the Manufacture of Blank Cylinders
for Sound Records.**

The claims involved in this suit are fully anticipated by the old operation of casting blank cylinders in tubular cylindrical molds. This proposition is necessarily sustained if it be conceded that the nature of the surface of the mold (whether smooth or marked), does not affect the nature of the *process* wherein that mold is used; that is, if it be conceded that a change in the surface of the mold does not *per se* change the process of using it.

Beginning on pp. 24-27, *supra* we have cited the evidence showing that, for more than 15 years, record tablets or cylinders have been made by pouring melted waxlike material into continuous cylindrical molds, and shrinking out the casting. We have also shown that, while blank cylinders are generally drawn forcibly out of their molds before being fully shrunk, this has not always been done, and in any event is not on that account a different procedure. Finally, we have shown that the shrinkage of blanks of waxlike material out of molds is referred to in Edison's patent No. 406,576 (D. R., p. 241), which states that the material

"shrinks slightly in hardening and can therefore, be readily removed from the mold."

Undoubtedly then, the practice, knowledge and literature of the art, for a period of more than a decade prior to the application for this patent in suit, embraced the operation of making cylinders for use in the talking-machine art by melting suitable waxlike material, pouring it into a continuous cylindrical mold, allowing it by cooling to set and contract therein, and removing the cast article by a "longitudinal movement."

Being now in possession of a cylindrical mold bearing

on its surface the pattern of a sound-record, the question is, do we practice a patentably different *process* in doing with the sound-record mold *exactly what was done with the smooth-surfaced mold?*

We think that to state this question is to answer it. The process performed with the smooth-surfaced mold is identically the same as that performed with the rough-surfaced mold. The process of subjecting leather to the pressure of a roller having a pebbled surface, is the same process as subjecting leather to the pressure of a roller having a smooth surface. (*Stimson v. Woodman*, 10 Wall. 117). Certainly changing the character of the surface of a die, mold, roller, or similar impressing device for impressing an impressible substance, does not change the process in which that device is used.

While we believe this proposition is obvious, it is conclusive of the case, and therefore is worthy of the fullest consideration.

If the contrary be assumed, namely, that the process is changed when the mold is one which has marks on its inner surface, although all the operations are precisely the same as before, it would follow that the process is changed every time a *different* marking is used on the mold, and there would be so many different processes as there are molds.

That this contrary view is untenable may be illustrated by considering the fact that every sound record mold *has a portion of its surface smooth*. It would be manifestly absurd to contend that the blank portion of the molded article is made by one process, and the marked part by a different process. Certainly the smooth part of the cylinder is made by precisely the same process as the grooved part, and by precisely the same process which has been in use for more than a

decade. It is clear that the difference is *solely in the mold*.

It follows from this that claims for a *process* are not distinguishable from the old art by reference merely to some peculiarity of the *mold*, such as the impressions or marks which it imparts to the molded article. In every case the surface of the article receives the impression of the surface of the mold, whether smooth or marked. The operation and result in all cases are identical.

Anticipation by the 1892 Edison Patent.

The Edison patent No. 484,582 dated October 18, 1892 (D. R. 190-192), was granted on an application filed January 5, 1888, which was renewed (after forfeiture), March 30, 1892. [The file-contents of this patent are printed in D'ft's Rec., pp. 154-192].

Mr. Cameron, defendant's expert, points out very clearly, beginning page 28, D. R., that this 1892 patent (generally referred to as the "split-mold" patent) discloses all that the patent in suit discloses, so far as the claims here involved are concerned.

Referring to the text of the 1892 patent we find that its object is:—

"to produce a *practical process** for the duplication of phonographic records, so that the new art of phonographic publication can be established. Generally I propose to construct a suitable matrix, preferably in metal, and by its use *mold* duplicate phonograms with the phonographic records thereon." (P. 1, lines 9-15 of printed specification.)

*Mr. Dyer says that to use this process with a split mold was obviously an *impractical* process, and we agree with him. The obviously practical and *only* way of using this patent is to employ the mold in its original *continuous* condition.

The specification is occupied mainly with the description of the manner of making the mold, namely, by utilizing the electric arc to vaporize metal *in vacuo*, and causing this vaporized metal to deposit on the original record. This is a well-known process and is called the "vacuous deposit" process. When used as in this patent it results in the production of a continuous cylindrical mold, bearing on its inner surface a negative impression of the original record used as a pattern. Turning to the claims we find that *every one* includes the process of forming a matrix by vaporizing metal in *vacuo*, and thereby covering the original record with a metallic deposit. Claim 4 adds to this process the step of

"producing duplicate phonograms from such matrix."

The patent does not purport to describe any *new way of using the mold*, and it was not necessary to describe the ordinary way of using molds. The patent *does* say that the duplicates can be made "of suitable substances such as *wax or wax-like material*" (p. 1, line 79), and by the process of casting, i. e. "*pouring therein, and preferably around a suitable core*" (l. 77).

This is exactly what the patent in suit proposes, the "*wax or wax-like material*" in use in 1892, being the soap-compositions referred to in the 1901 patent in suit.

It is true that the 1892 patent proposes that the mold be split longitudinally into a number of parts, so that the mold "can be closed to receive the material to be molded, and opened to permit of its being taken out;" but this suggestion did not add anything to the art as it then existed, or to the fullness of description of the patent. Its omission takes nothing from the fullness of description. Side by side, in Figs. 4 and 5, we see the

two common forms of cylindrical molds, one continuous, the other divided. The use of both was well understood. It needed no "inventor" at that day to say that the sectional mold may be opened to deliver the casting. Neither did it require any inventor at that day to say that, in using the continuous mold, the casting must be allowed to remain in the mold until it has sufficiently contracted to permit its removal.

At the date when the application for this patent was filed (January 5, 1888) the sound-recording art was in its infancy, and a search for the most suitable wax-like materials was then in progress. But *when the patent issued*, more than four years later (October 18, 1892) the soap compositions, with their low melting point and high coefficient of expansion and contraction, had come into general use. Not only so, *but record cylinders were made by casting in continuous cylindrical molds*, as has been pointed out.

Hence, even if it were supposed in January, 1888, that one *must* use a sectional mold for lack of a material which would contract enough on cooling to permit of withdrawal from a continuous mold, it was *well-known* in 1892, that the wax-like materials then in use contracted on cooling down from the melted state to an extent *many times greater than what was required to clear the mold*.

Moreover, not only was the suggested expedient of splitting the mold unnecessary, but Edison found, as soon as he tried it, that *it was not practical to use a split mold because of the fin which inevitably forms at the meeting edges of the sections*.

Edison admits that *in 1888* he abandoned the attempt to use split molds (C. R., 137, Q. 4). Aylesworth testifies to the same effect (p. 129, X-Q. 88). Complain-

ant's expert says that "perfect results can *only* be secured when the mold is continuous" (p. 182).

Hence, the invention set forth in the 1892 patent could *only be carried out practically with a continuous mold*; and Edison not only knew this, *but he had abandoned the use of split molds entirely for more than four years prior to the issue of the 1892 patent.*

Bearing in mind that the 1892 patent describes a continuous mold as well as a split mold, that none of its claims refers to splitting the mold, that it specifies using wax-like materials which contract far more than necessary to clear the mold, and that the use of continuous molds *with this very material* was well known, how can it be conceived that the Court will find it to be the discovery of a *new process*, to refrain from splitting the mold, and to use it in its original continuous state, and in the manner in which continuous molds are always used?

We would further ask, is it conceivable that, if Edison made a new invention in discarding his impracticable suggestion of splitting the mold, he would, *four years after making that invention, have renewed his application for patent without attempting to patent the new invention?*

The only possible view of this situation is that the 1892 patent disclosed and covered everything that Edison had invented up to that date in relation to casting sound-records; and so it did. It disclosed the continuous mold as well as the split mold, and its claims cover the use of one as well as the other. To show this more clearly, we quote claim 4 which is the *narrowest* claim of that patent:

"4. The process of duplicating phonograms carrying a phonographic record, consisting first,

in indenting the original record upon a phonogram; second, constructing a matrix or mold of such original record by depositing thereon a coating of metal by vaporizing metal in a vacuum in which the record is placed, and third, *producing duplicate phonograms from such matrix, substantially as described.*"

Since it was proposed, in that patent, to use not only wax-like materials, but also certain other materials which could not be shrunk out of the mold, it was obviously necessary, in order to use materials of the latter class, to resort to the common expedient of dividing the mold into sections. *It certainly was not necessary to tell the persons skilled in the art, to whom the specification is addressed, that with materials which shrink sufficiently on cooling, it was neither necessary nor desirable to resort to the expedient of dividing the mold into sections.*

Nevertheless, it will be contended here that Mr. Edison made a mistake in supposing in 1888 that satisfactory sound-records could be cast in sectional molds, which in the same year he discovered not to be feasible; that in 1892 he issued a patent suggesting the use of split molds and not telling the public that it was impracticable to use the mold in that form, and that *therefore* he can have a patent in 1901 for the discovery of his own mistake. The foundation of this proposition is that Edison is entitled in 1901 to a patent for the use of a continuous mold *because he told the public in 1892 that a split mold could be used* although he had known for four years that it could not be used.

Our view of this 1892 patent—namely, that it is a complete and effective disclosure of all information needed by those skilled in the art for making a con-

tinuous cylindrical mold and casting a wax-like record therein, including the removal of the record after shrinking,—is absolutely confirmed by Mr. Edison's conduct.

Mr. Edison (as he tells us himself) was well aware, for a period of four years before this 1892 patent issued, and nearly four years before the renewal application therefor was filed, that the use of a split mold was impracticable, and that the process of this 1892 patent could *only* be practiced in a continuous mold. To suppose that, knowing this, he procured the issue of this patent for a process of making and using a sound-record mold, *withholding the information of the only practical way of using it*, would be to suppose him guilty of outrageous bad faith, which would be fatal to his present pretensions. But there was no bad faith about it. Edison did not, in that specification, say expressly that in casting records with the shrinkable wax-like material the casting could be removed, after shrinkage, from the end of the mold, for the simple, sufficient and honest reason, that *it was not necessary to state that fact to persons skilled in the art*. It was a fact already well known, and therefore not requiring to be stated.

Therefore, the performance of the operation described in the 1892 patent and particularly specified in claim 4 thereof, would involve everything called for in the claims involved in this suit, including the shrinking of the record both diametrically and longitudinally. Since with wax-like materials the shrinkage would inevitably occur, and since the longitudinal withdrawal is something which can obviously be done when shrinkage occurs, and impossible otherwise, the omission of the specification to say that the casting could, after shrinking, be removed in that way, did not leave the public in

need of an "invention" or patentable "discovery" to impart knowledge of that fact.

Complainant's contention is that the transition from the idea of using a split mold to the idea of using a continuous mold was the result of the invention by Mr. Edison of a new process of removing the molded article from the mold, to wit, the process of allowing the article to remain in the mold until sufficiently contracted to permit of its removal, and then removing it by a direct longitudinal motion.

We say that this so-called process always existed in connection with continuous cylindrical molds, and that, moreover, the step from the split mold to the continuous mold was not the result of, or made possible by, the discovery of this "process." The evidence clearly shows the fact to be that Edison turned away from the split-mold because he found (as might have been expected) that the molded article took the impression of the seams of the mold. He resorted to the continuous mold to avoid this objection, and so far from having arrived at the continuous mold *in consequence* of the discovery of a new way of using it, he adopted the ordinary way of using that mold *as an incident of the adoption of the mold itself*.

Again the evidence shows clearly that experiments of 1888 and thereabouts were not concerned with the manner of removing a sound-record from a continuous mold. They were directed to the difficulties arising from air-bubbles, stickiness of the material, unequal shrinkage, etc. These troubles were not overcome by withdrawing the record "by a direct longitudinal movement," and to suggest such a thing would be plainly ridiculous. Therefore, what Edison required in 1888 in order to realize the casting of sound-records in an effective man-

ner, was the knowledge of a material having certain ideal properties; and he admits that this ideal material was discovered by his assistant, Aylesworth, at a date not specified, and is kept a secret.

The proposition that the art of molding records was advanced, or made commercial, by the discovery of a process consisting in shrinking the sound-record out of the mold is unfounded, and is thoroughly disproved by Edison's deposition. That proposition could not, in any event, be true, because the fact of shrinkage is not due to a process, but to *the properties of the material used*, and the only possible room for patentable invention would be in a *material* having the properties required for the effective application of the *old* process.

When, therefore, we find that the 1892 patent and the 1901 patent describe *precisely the same materials*, as well as the same operation or process of casting a sound record in a mold, it follows as a necessary conclusion that the 1892 patent *discloses all that the 1901 patent discloses* with respect to the conditions requisite for taking a sound-record out of the end of the mold. Complainant's counsel recognizes that this is the essential matter when he pressed upon Edison the question what "conditions made your shrinking out of the continuous molds of standard length *a possibility*," (C. R., p. 148, Q. 66); and Edison destroyed the entire basis of complainant's contention when he replied that

"Messrs. Miller and Aylesworth had produced a *material* which had the very fine properties for this purpose."

One consequence of construing the 1892 patent as desired by complainant should be noted. The real invention which Edison made in this art was *the method of*

*making a mold by vacuuous deposit.** The 1892 patent covers this mold or matrix and covers "producing duplicate phonograms from such matrix." Complainant's expert tells us that obviously the *only* way of producing duplicate phonograms from such matrix is by shrinking them out, and Edison knew this to be the case four years before he filed the (renewed) application upon which this 1892 patent was granted. But, upon the theory of this suit and No. 1103, the public will not be permitted on the expiration of that patent to use said mold, because Edison has, in 1901 and 1902, secured patents which cover the *obvious and only practical way of using it*.

Whether or not there might or might not have been, after the issue of this 1892 patent, a patentable difference between a split sound-record mold and a continuous sound-record mold, need not be considered, particularly as continuous molds are described in the Lioret and Young patents of 1895. Certainly there was no new process in the *use* of a continuous mold, and in taking the cast record, after sufficient shrinkage, out of the end thereof.

* Everything else constituting complainant's system of making molded records was invented and (except the secret composition) patented by Miller and Aylesworth.

No Invention in View of the Appelt and Day Patents.

It being common, in casting cylindrical articles, to employ a continuous cylindrical mold, and after allowing the article to contract sufficiently in the mold to remove it by a direct longitudinal movement, there is, and can be, no invention in doing the same thing in making a sound-record.

Appelt's patent (D. R., p. 203) describes casting a drawing roller, and says that

"the roller will easily come out of the tube *a* in consequence of the shrinkage which all compounds composed principally of gelatine and of glycerine undergo."

Day's patent (D. R., p. 271) provides for circulating cold air through the interior of the mold

"thereby drying the tubular roller, causing it to shrink at the inner surface and withdraw itself from the outer tube *C*, when it may be removed from said tube and mounted in a manner presently to be described."

We do not contend that there *may not be* great differences between the process of making a tubular roller and that of making a sound-record; but, on the other hand, it is obvious that the two *may be*, and in *certain respects are*, precisely alike. It is likewise manifest that in the respects wherein they differ the differences may well be of a patentable nature; but it is equally obvious that *in the respects wherein they are precisely alike* there is nothing that can be claimed.

In this case (and in suit No. 1103) we are dealing simply with the act of taking an article out of the end of a cylindrical mold, and we contend that it is *the same act*, whether the article be a cylinder which is to be

used as a printing roller, or one that is to be used to make a sound-record on, or one which already has on it the tiny undulations which constitute a sound record. We maintain that the removal of the molded article depends *in every case* upon the property of the material employed; that when a material which contracts on cooling is used it requires (and admits of) no invention to do it, and that when a material is used which does *not* have that property, it cannot be done at all.

Therefore, it being old to remove tubular castings from continuous cylindrical molds by a direct longitudinal motion (after the incidental shrinkage of the casting) it cannot possibly be a matter of invention to remove a sound-record by that kind of a motion.

Complainant's expert comments on the Day and Appelt patents in his deposition in suit No. 1103 (p. 249 et seq.), but while he points out differences of detail in the operation of *casting the respective articles*, he is not, of course, able to show that the act of *shrinking, and direct longitudinal motion* is different in the patent in suit from the manner of removal described in the Appelt and Day patents.

If we could admit (which we cannot do) that to take an article out of its mold "by a direct longitudinal movement" is in any case a process, it is the *same process* regardless of the use to which the product of the process is to be put.

No Invention in View of Lioret and Young Patents.

The disclosures of these patents (D. R., p. 250, and p. 295) have already been set forth with sufficient fullness (p. 29 *ante*). It remains only to point out their application to the claims, and this can be done in a few words.

The pertinent fact is that both patents describe the

use of continuous molds. The process of forming the molded records according to these patents is that of "pressing;" but since "casting" was an alternative and known way of using a mold this difference is not material. The alleged novelty of the claims sued on is in the contraction of the record and its removal from the mold. Lioret (D. R., p. 257) describes the cooling and hardening of the record, in consequence of which it is "generally contracted sufficiently to permit the easy withdrawal of the ring C" (which is the record) from the mold.

Here is the contraction by cooling and easy withdrawal. It is true that Lioret's record was turned in withdrawing it, but this was merely incidental to the peculiar form of the record, and *not necessary when an ordinary record is duplicated by Lioret's process.*

Young (D. R., 295) proposes using such a thin film for his molded record that it could be slightly collapsed inwardly, but since he used the same material as in Edison's companion patent 713209 (celluloid) and cooled it after pressing the record, it is evident that in using Young's process the record would shrink loose from the mold and could be withdrawn without collapsing. In other words, if one did exactly what is set forth in Young's British patent, including cooling the record, the latter would shrink loose from the mold. Certainly it would require no invention to take it out.

To state the matter in a little different way, we submit that in applying Lioret's process to duplicating a sound-record of the ordinary kind (i. e., one made on a smooth-surfaced blank), it would not require an invention, after the shrinkage of the record, to withdraw it without using the rotatory part of the withdrawing motion which was necessary in removing one of

Lioret's molded records from the mold. It would not even call for the exercise of good judgment to do this. It would be idiotic to do otherwise than take the record out with a "direct longitudinal motion."

Now, Young's patent refers to Lioret's prior British patent, so that we have an express warrant for coupling the two together. Young proposes doing just what we have been discussing, i. e., applying Lioret's "pressing" process (or a modification thereof) to an ordinary (smooth surfaced) sound-record. Hence, if there were any possibility that a skilled workmen would, in that kind of process, think he had to turn the record while withdrawing it, Young's patent would exclude that possibility.

Claim 1.

This claim calls for separate consideration. We have already shown that it is a remarkable formulation. It is no exaggeration to say that it differs radically from all patent claims which we have had occasion heretofore to consider. It is an oddity, a curio, an eccentricity, a freak.

The nature and office of a claim are to define the ambit of a new invention—to mark clearly the meets and bounds of the patentee's property, so that the public may know with certainty where its rights end and the patentee's monopoly begins. A claim must (to be a valid claim) portion off a *definite territory*, within which, one who enters without the patentee's license, is a trespasser. *This claim has the magic and unique property of shifting itself so as to be always in the way of one who is trying to avoid committing trespass.* It is an automatic or self-adjusting claim, always barring that particular way which the competing manufacturer is attempting to follow, while seemingly leaving all other ways open. There are ten thousand paths which the maker of molded records may chose; and apparently this innocent-looking claim bars only one, namely, that which, starting with a mold having the impressions of the sound grooves disposed in a spiral of a pitch somewhat coarser than 100 to the inch, results in a record whose spirals have exactly a 100-thread pitch. Thus complainant's expert expounds the claim (C. R., p. 209, X-Qs. 25-28). But upon application of slight pressure he discloses that this interpretation of the claim holds good *only because and so long as the trap is set for a particular manufacture.* For the time being, all the other degrees of pitch are open to defendant's choice; and this condition obtains *until defend-*

ant attempts to chose one of these open paths. When that happens, this claim, in virtue of a self-contained automatic adjusting movement, immediately places itself in *that particular path.*

This is accomplished by the potentiality of the word "desire." How simple and effective, and yet how characteristically modest! Why be gasping, and claim *all possible ways of doing* a thing, and thus provoke the condemnation of the law? Edison has discovered a better plan, and is content to limit *his* claim to that particular way which is, at the time, the "desired" way, leaving *all other ways open.* This, therefore, is not only a definite and limited claim, but is one that offers no difficulty in its application. The question of infringement ceases to be a question. We can infallibly tell what the manufacturer *desires* by what he is making, for it could not be supposed that he would be making it unless he "desired" so to do. Thus all necessity for inquiry is avoided, and we reach the sure conclusion that whatever the manufacturer may be doing, he is infringing this claim if he casts a sound-record in a mold.

We apprehend, however, that this attempt to establish a new species of patent claim will not receive the sanction of the court. As the law now stands it is exposed to certain objections which it is our duty to point out.

Claim 1 Does Not Set Forth an "Invention."

The proposition that the subject-matter of claim 1 is not an invention in the sense of the law may be established by a variety of considerations. We will set these forth to a sufficient extent to establish the proposition fully.

The foundation for the claim is found on page 2 of

the specification of the patent, beginning line 115, where it is stated that, by reason of the shrinkage of the record on cooling, the pitch of the spirals will contract to a corresponding extent. This fact, of course, was obvious to every one familiar with the art of casting. The specification continues:

"For this reason it is desirable that the *original record* from which the matrix is made is formed on a phonograph or allied talking-machine having a fewer number of threads on its feed screw than the instrument on which the duplicates are finally used, in order that, when the contraction has progressed to its finality the pitch of the record-thread on the duplicate will correspond to the pitch of the feed-screw of the reproducing machine, or approximately to that pitch."

In this we have only the statement that, as we are dealing with a material which shrinks upon cooling, it is desirable to make a proper allowance for the shrinkage. There is no *process* suggested. The invention does propose any new operation at all, and certainly nothing tending to *prevent* the shrinkage.

The claim corresponds with this descriptive matter, specifying as "*a process of duplicating sound records,*" a procedure which is characterized and distinguished by—

"Making the *original* record with a spiral record groove of greater pitch than *that desired* on the duplicate to be produced."

(a) This is not an invention because it involves nothing more than the common work-shop expedient of making due allowance for the shrinkage of the material worked with. The claim indicates ignorance on

the part of Mr. Edison and his associates of the most common expedient in the molder's art.

If it can be said of anything that it is within the province of the skilled workman, that statement can certainly be made of the matter of making allowance for shrinkage. But we need not invoke this proposition, for the art of molding takes notice of the shrinkage of castings, and of its effect not only on the dimensions of the casting, but also upon the spacing of the several parts, and has long been equipped with a simple device whereby the proper allowance is made in preparing the pattern for the mold.

For the application of this fact it is only necessary to bear in mind that the original sound-record is, in the operation of molding records, the pattern from which the mold is made. What we are here considering is the effect of contraction in drawing closer together the spirals of the sound groove. This condition is, of course, of constant occurrence in casting, and the device used for making the needed allowance is called a "shrinkage-rule." This is like an ordinary measuring rule except that instead of measuring feet and inches exactly, it measures the linear units with the allowance added for the particular material with which it is to be used.

This device is described in every book dealing with the making of patterns (D. R., p. 196). The definition in the Century Dictionary is as follows:

"Shrinkage Rule. A rule used by pattern-makers in which graduations are so much larger than the normal measurements that the patterns measured off by such a rule will be *large enough to allow for shrinkage, without any computation on the part of the workman*. The rule must be graduated with reference to the particular metal to be cast."

The evidence (D. R., p. 120) shows how this rule is used with patterns having screw threads, teeth, etc., which will be drawn together by the shrinkage; but the use of the device is clear from the above definition.

If one went to a pattern-maker and told him the conditions, namely that the records were to be cast, and were to have one hundred threads to the inch, he would simply measure the surface of the pattern (i. e., the original record) with the appropriate shrinkage rule, and lay off one hundred threads to an inch as measured thereby. This would give the desired pitch on the casting. It is the common practice of the art, being just what shrinkage rules were contrived for (D. R., p. 120, Q. 2).

Apparently the shrinkage rule was not known in the Edison laboratory. Several of his assistants had never heard of it (C. R., p. 98, X-Q. 122).

This claim, therefore, covers no more than the use of a common shop implement.

If, however, there were no shrinkage rule, the making of the proper allowance for shrinkage would not be a matter of invention, but merely one of calculation. If something were done to the material to *prevent its shrinkage*, we might have an invention; but certainly it is not an invention to let the shrinkage occur. Manifestly the same shrinkage occurs, and the same result follows, whether an allowance has been made for it or not.

(b) Claim 1 does not state an invention because it covers no new means of any sort, nor the doing of anything different from what was previously done. If sustained, it would cover *every cast or molded record which could be used on any reproducing machine*. The fact that the material shrinks on cooling is simply *a fact*.

It is not an operation performed on the material, or a property imparted to it. Moreover, it is a fact known of this general class of materials from time immemorial, and of this particular composition *well known for fifteen years*. Inasmuch as every cast record shrinks, that which alone characterizes this claim inevitably occurs in every instance; and if there be any reproducing machine upon which the record can be reproduced, it would infringe this claim, for the record would then have the pitch "of the reproducing machine, or *approximately that pitch*."

Complainant's expert, in his vain effort to escape this conclusion, repudiates utterly the statement of both specification and claim, and puts forward a very different claim. He says that the claim does *not* mean "making the original record-groove of greater pitch than that *desired* on the duplicate to be produced," but, on the contrary, says it means the production of a *definite product*, to wit *a sound-record having a sound-groove with 100 threads to the inch*. His testimony as to the meaning of this claim is as follows:

"The first claim covers broadly the production of duplicate phonograph records *having a record groove of the standard pitch, namely, one hundred per inch*." (C. R., p. 171.)

This statement is repeated in answers to X-Qs. 25-28, p. 209. We quote:

"28 X-Q. Then the 'definite product' to which claim 1 solely relates is a sound record having a hundred threads to the inch; is that what you mean to say?

"A. Yes; assuming that you mean a duplicate sound record. The first claim covers a process *for making such a product*."

There is nothing of this sort in either specification or claim. There is no mention of producing a definite product; there is not a statement or hint that the product must conform to "a standard," much less that the invention consists in making a sound-record having a one-hundred thread spiral, or that the pitch of the recording machine's feed-screw should be about 98 1-3 threads. On the contrary, the specification, as to this detail, explicitly states that it is "desirable" that the *original* record be made on a machine whose feed-screw has a "fewer number of threads" than "the instrument on which the *duplicates* are finally used;" and the claim says, "making an original record with a spiral record-groove, of *greater pitch* than that *desired* on the duplicate."

These facts also point to a pertinent conclusion with respect to infringement, as will be seen later on; but they are cited here simply as showing how far complainant's expert has departed from the specification and claim.

On examining the statement last above quoted from the specification, it will be seen that the thing specified would be accomplished either by making the feed of the *recording* machine a little more steep, or that of the *reproducing* machine a little *less* steep. Either procedure would establish the recited conditions, one would be as much an invention as the other, and the change in *the machine* would infringe the claim as well as that in the record.

(c) Claim 1 does not cover an invention because the expedient was an obvious one, not involving the exercise of the inventive faculty.

This proposition is supported by the consideration of what was known of the effect of shrinkage and of the common expedient of making allowance therefor.

It is, moreover, fully established by the proofs. Edison himself does not describe the mental process by which he arrived at the idea of making allowance for pitch as an *inventive* process. Speaking of the discrepancy in pitch between the thread of the sound-record and that of the reproducing machine he says (p. 140, Q. 19):

"We found that if we were going to make successful duplicate records to fit the machines with a universal standard thread which we were putting out and which we were to put out, that we had to get some way of correcting this, and *it occurred to me* that, if we knew what the contraction was, we might take the original matter on a machine whose threads had a greater pitch, and when it reached normal temperature it would have the same pitch as the standard screw of 100 threads," etc.

This answer shows that there was no invention involved. There was a discrepancy—a lack of correspondence, between the two things which were to work together,—and the obvious thing was to change one or the other so as to bring them into correspondence; and since shrinkage caused the discrepancy, the obvious remedy was to allow for it.

Edison says that it first occurred to him to allow for the shrinkage of the pitch of the sound record sometime in 1888 (p. 155, X-Q. 90). If, therefore, he considered that he had made an invention when this idea occurred to him, it would be hard to explain why he took no step to secure it when he filed a caveat in October, 1888, when he renewed his application for the casting process in 1892, or when he filed his application for patent No. 713209 in March 5, 1898, and did not even con-

sider it necessary to *mention* the expediency of allowing for shrinkage.

Adding to this the fact that Macdonald did not have to make an invention in order to remedy the effect of shrinkage, and that his patent also makes no reference to it, and we have conclusive proof that this expedient was within the province of the skilled workmen, and indeed was already common practice in the art.

(d) The claim does not specify a patentable invention because the carrying out of the alleged process therein defined depends, *not upon the procedure followed*, but *entirely* upon the particular standard of reproducing machine which may happen to prevail at the time, i. e., upon the particular pitch of the feed-screw upon the talking machines in use at the time.

This is not alone *our* interpretation of the claim. It is that of complainant's expert. He says:

"Certainly, the carrying out of the process of the first claim DEPENDS ENTIRELY UPON THE PARTICULAR STANDARD WHICH MAY BE USED, which at the present time is 100 threads to the inch." (C. R., p. 214, X-Q. 37.)

Mr. Dyer's answer to this and the succeeding cross-questions show the claim to be such that one is free to do every act specified in it, so long as there happens to be no talking-machine in use whose feed-screw corresponds in pitch with the spirals of the record thus produced.

Complainant's Argument in Support of Claim 1.

Complainant's argument is found in Mr. Dyer's answer to X-Q. 31 (p. 211), wherein he quotes from his brief before the Examiners-in-Chief in the U. S. Patent

Office, the arguments which prevailed with that tribunal; and also in their decision (C. R., p. 368).

Mr. Dyer based his argument in the Patent Office upon certain assumptions. He assumed that, when the first duplicates were molded, there was a skipping of the reproducer, and that the reason for this was very obscure, and "could be attributed to almost any cause." He further assumed and stated to the Appeal Board as a fact, that the discovery of the true cause "required patient investigation," which would involve a "long story;" and that the true cause was "finally discovered." This cause was the shrinkage of the record in cooling and the remedy applied was to make suitable allowance for the shrinkage.

The Appeal Board accepted these statements as true, and the conclusion drawn therefrom as sound.

The testimony herein does not bear out Mr. Dyer's statements at all.

Mr. Edison says (p. 140, Q. 19) that among the many troubles they had in molding records, was "that our reproducers required a great deal of adjustment, not always, but in most cases, and we came to the conclusion that it was due to the change in the number of threads." There is no statement of any patient investigation, or of any obscurity whatever in the cause of this discrepancy.

Nor is there any claim of inventive struggles or travail in generating the remedy. It came quite simply and obviously. Edison says:

"it occurred to me that if we once knew what the contraction was, that we might make the original master on a machine whose threads had a greater pitch."

Every opportunity was given Mr. Edison to say that there were obscurities and difficulties in locating the cause of the necessity for adjusting the reproducer, but he would not do so. The following question and answer are very significant:

"68 Q. A criticism of the first claim of your patent in suit No. 667,662 is that the making of a master of greater pitch than the standard in order to produce a duplicate of standard pitch was obvious in view of the general practice in the art of casting metals where the mold is made larger than the intended size of the article cast in it. What is your view of this criticism?

"Objected to as stating neither the criticism nor the claim to which the criticism is addressed.

"A. Well that's generally said of every new invention; but obviousness only comes after; its post-mental. What I mean by this is that if there is—the history of invention shows that if there is a certain thing wanted and many thousand patents are taken out and yet none of the things wanted are produced and sold, and there comes along an inventor who does some little thing to one of these many thousand patents on the same thing, and it becomes at once of universal use, that little thing is generally what is called "obvious." Every inventor knows that there are very few of the obvious things that work; it is the ones that were not obvious that work.

"The answer is objected to by defendant's counsel as not containing any matter of fact or expert opinion, but merely a metaphysical discussion."

Then follows a series of questions in which every effort is made to induce Edison to make some state-

ments which would support the expert's theory, but he will not do so. We are told by the witness that compounds have different properties, some contracting more, some less, some not at all; that the round groove is very small and difficult to see; that he had no microscope in those days, and so on. But there is not a single word to the effect that, when the reproducer skipped a thread, the reason was *not* perfectly obvious; and not a word to the effect that the remedy was not obvious, but had to be invented. Edison's cross-examination tends to show that the expedient of allowing for shrinkage suggested itself as soon as the shrinkage appeared. Certainly it suggested itself *in 1888*, as already shown.

Clearly, the Examiners-in-Chief were misled as to the facts.

Indeed, without any evidence at all, it must be obvious that if a reproducer is observed to skip threads on a record, the reason *must be* that the pitch of the record thread varies from that of the feed-screw of the reproducer. But even if this were *not* obvious, and if it required "patient investigation" to discover the reason, we are no nearer the conclusion that invention was required to supply the remedy. *The discovery of the cause of a phenomenon is not a patentable discovery.* After the cause is known, the question is, *did it require invention to devise a remedy?*

There is not a word in the evidence to indicate that it did. On the contrary, we submit it to be an obvious fact that, the art of casting being well known, and the allowance for shrinkage being the customary practice of that art, the knowledge of the *fact* of shrinkage must carry with it the suggestion of the common remedy of allowing for shrinkage. In other words, the remedy did not have to be devised. It existed already.

The argument in support of this claim is further considered in our discussion *infra* (see page 154) of the deposition of complainant's expert.

Claim 1 Does Not Cover a "Process."

If there be any patentable novelty in making due allowance for the inevitable shrinkage of the article on cooling, it is clear that the patentable thing is not a "process." A process is an act or series of acts (usually involving chemical or elemental action) performed upon the material under treatment, whereby it is reduced to a different state or thing. (See p. 48 *supra*.)

Transforming a piece of wax into a sound-record, by melting it, and pouring it into a mold is certainly a "process," and any variation of temperature or other step of treatment, which was new and which effected a beneficial result, would constitute an improvement in the *process*. But this claim recites no difference of any sort in the *process*. That consists, as it always has consisted, in melting the material and pouring it into the mold, wherein it is allowed to solidify by cooling. The departure from previous practice which this claim sets forth, is a difference in the *mold*, or rather in the pattern from which the mold is made. That is to say, the previous practice involved the use of a mold having 100 threads to the inch, whereas this claim calls for one having about 99 threads to the inch. The *process of using the mold*, i. e., of making the sound-record, is precisely the same in both cases. (See Mr. Dyer's testimony, pp. 221, 222, X-Qs. 55, 57, 60.)

Mr. Dyer admits (as is clear) that, having one mold whose inner surface has spirals of a pitch of 100 to the inch, and another identical in every structural respect,

but having on its surface spirals of a pitch of 98 2-3 to the inch, by casting a record in each of these molds using *exactly the same process in both*, the use of the first mold would not infringe claim 1, while the use of the second mold would infringe 1 (p. 222, Q. 60).

This is a demonstration that, if this claim specifies any difference from the prior art *it is not a difference in process*.

We find in the examination of Mr. Edison a clear recognition by his counsel of the fact that the subject-matter of claim 1 is not a *process*, nor indeed any part of the operation of molding duplicate sound-records, but is simply a change in *the pitch of the feed-screw of the machine* upon which the original record. Mr. Dyer defines the subject-matter of claim 1 as follows (p. 150):

"70 Q. At the time you made *this invention* covered by claim 1 of patent 667,662, the time you made *the invention of the coarser pitch master*, was there anything in the nature of the waxes used which prevented you from readily seeing what the result was in the resulting record?"

Claim 1 Does Not Cover a Process of Making a Sound Record.

If it could be held that Claim 1 sets forth a new process of any sort, it nevertheless does not set forth a new process of casting a *sound-record*.

In locating the place and character of the departure which this claim seeks to define and to cover, it has been seen that it does not lie in the process of casting the record. In that process no change whatever is proposed. A difference in the markings on the surface of the mold might be regarded as a difference in the mold, and we have considered it under that aspect. But on

scrutinizing this it is seen that the nature of the markings on the surface of the mold cannot distinguish it patentably, or we might have as many distinct inventions as there are molds.

Nor can the change be located in the process of *making the mold*, which is made just as molds were previously made; nor in the *process* of making the original record. That is made in the same manner as heretofore. Pursuit of the inquiry to the end shows that the difference, and the only difference, is in the *pitch of the feed-screw of the recording machine upon which the original record is made*. Clearly this is not an improvement in the *process* of molding the *duplicate* record.

The claim on its face presents the contradiction of asserting that it is a process of duplicating a certain thing the peculiarity of which process of duplicating consists in *the thing duplicated*. It claims a process of *copying* which consists in the nature of the thing copied.

This is not a technical criticism of the language of the claim, but a valid objection. This claim cannot be sustained, even though it specifies a novel and meritorious invention, unless that invention be *a new process of duplicating by molding a sound-record*. If, after the original record is made, the process of molding is that previously practiced (and this is admitted) the claim is bad. This must be true even if, in making the *original* record, a new and patentable process was employed, because this patent does not deal with the making of the original record, but with the making of molded duplicates therefrom.

But the application of this proposition will not involve any hardship, because it is clear that there is no

new or different process of making the original, but merely a slight departure from common practice in the pitch of the feed-screw of the machine upon which the original record is made. The *process* of making the original record is exactly what it was before.

A Result Not Patentable.

O'Reilly v. Morse.

That an inventor can monopolize by letters-patent—not the *result* accomplished by his invention but—the *novel concrete means* whereby it was accomplished, is a fundamental doctrine, and one whose application disposes of this case.

We have already made it clear that the idea presented by the claims is “the idea of a result” and not the “idea of means.” The subject-matter of the claims is the withdrawal of the record from the continuous mold after the former has been cast therein. As Edison said, it was an “ideal” thing, but there were “enormous difficulties in the way” (C. R., p. 140, Q. 18).*

Shrinking out the record, or withdrawing it after contraction, was not a *new means* called into existence by the patentee for the purpose of overcoming a difficulty; but was a thing he set himself to accomplish, and which was itself beset by “enormous difficulties.” This view of the claims as consisting in “casting the duplicates and shrinking them out of the mold” is that of complainant’s counsel as stated in Q. 18, p. 140. (See also Q. 65, p. 148.)

An invention does not exist until concrete means have been devised which overcome all difficulties and realize the end desired. Therefore the above quoted answer of Edison (and indeed the history of the whole matter) discloses that what claims 2, 4 and 5 set forth was the *object sought*, and not the means of its realization.

*We have pointed out that complainant’s counsel clearly recognized this to be the character of the invention in asking (p. 148, Qs. 65, 66, 67) what were the conditions which made the shrinking of the sound-record out of the mold a *possibility*. Manifestly the “shrinking out” was the result sought, and the invention, if any, was *that which rendered it “a possibility.”*

To illustrate, the electric current is an agent or "means" which has been applied to many uses. When it was first proposed to mark or print intelligible characters at a distance by means of the electric current, the idea was one of an *object sought* and not of a *patentable means*, notwithstanding that the electric current *was* the means which it was designed to employ. So likewise in the case before us, the idea of shrinking out the cast sound-record was an object sought and not a patentable means.

This was the fatal defect in Prof. Morse's 8th claim, which was for "the use of the motive-power of the electric current * * * however developed, for marking or printing intelligible characters, signs, or letters at any distances, being a *new application of that power*."

Here was undoubtedly a new thing, namely the process of marking or printing intelligible characters at a distance, by a new application of the motive power of the electric current. Moreover, *Morse had done this new thing*, the "enormous difficulties" which had previously stood in the way had been overcome *by him*, and he had brought forth a great and epoch-making invention.

Just as Morse's claim proposed merely a thing to be done by the new application of the old electro-motive power, so Edison's claims propose the making of sound-records by the application thereto, of the old operation of casting and shrinking out the cast article.

Complainant may say that Edison's *result* is the removal of the record from the mold, and that his novel means of doing it was shrinking out, and hence he does not claim the result, but the means of doing it. With better reason Prof. Morse could have said that marking characters at a distance was his *result*, and the electric current the new means of doing it.

In the famous case of *O'Reilly v. Morse* (15 How., 62) from which this illustration is taken, the Supreme Court said:

"No one, we suppose, will maintain that Fulton could have taken out a patent for his invention of propelling vessels by steam, describing the process and machinery he used, and claimed under it the exclusive right to use the motive-power of steam, however developed, for the purpose of propelling vessels."

And the Court continues, giving other appropriate illustrations of the proposition that the application of a known agency to a new purpose cannot be claimed, even where one has invented means (a process or machinery) *which rendered such application a possibility*. The casting and shrinking out of tubular articles was a *known* means, just as steam was a *known* motive power, and the electric current a *known* agency. Therefore, the mere application of that *known* means or agency to the production of a sound-record could not be claimed as an invention, even though new inventions had to be made in order to overcome the difficulties in the way of its accomplishment. To permit that, would permit one to monopolize a *result* instead of monopolizing *the new means which he has created whereby that result is accomplished*.*

If the withdrawal of the sound-record after cooling

*This is a very strong case, because Edison's claim to the use of casting and shrinking out in the making of sound-records is advanced *regardless of its realization*. If one who has actually realized such a result may not claim it, but may claim only his new means, *a fortiori* one who has *not* realized it may not be permitted to claim it. Edison admits that the result was attained by discoveries of a new material, and of new processes and machinery by Miller and Aylesworth. All that Edison discovered, upon his own statement of the case, was the existence of "enormous difficulties," in consequence of which he dropped the attempt to cast sound-records, and took up with the pressing process.

encountered *no* difficulty, there would be no need or room for *any* invention. If it *did* encounter difficulty, then the invention would be the new means which surmounted that difficulty.

If then, Edison has discovered any new means whereby the existing difficulties in the way of shrinking out the cast records were overcome, he could patent those new means. He could not patent shrinking out a sound-record, regardless of the material employed and of the new mode of procedure (if any) whereby he attained the desired result. These new means are the subject-matter of other patents and of other claims of this patent, which claims are not involved in this suit, and are not used by defendant.

To claim casting and shrinking out, in any and every way and with any and every material, is forbidden for another reason; namely, because it cannot be done in every case. Edison repeatedly says that it can be done only with "*certain materials*," and was successfully done only after Mr. Aylesworth discovered his material. Again he says that sound-records can not be cast by introducing the wax into the top of the mold (p. 160):

"123. R-D. Was the casting of duplicates ever carried on at that time by pouring the wax into the top of the mold?

"A. Yes, but this wasn't good. This made a streak and air would get in. *You can't do it this way.*"

Edison, therefore, did not discover that casting and shrinking will always produce duplicate sound-records, and *could not have made that discovery, because it is not a fact.*

Precisely the same situation was presented in *O'Reilly*

v. Morse, as shown by the following passage in the decision of the Court:

"But Professor Morse has not discovered that the electric or galvanic current will *always* print at a distance, no matter what may be the form of machinery or mechanical contrivances through which it passes. * * * And it is to the high praise of Professor Morse that he has been able, by a new combination of known powers, *of which electro-magnetism is one*, to discover a *method by which intelligible marks may be printed at a distance*. And for the method or process thus discovered he is entitled to a patent."

While this case of *O'Reilly v. Morse* is conclusive, the doctrine there stated and applied being much more clearly applicable to the alleged invention of Edison than to the great invention of Prof. Morse, we think it expedient to consider further the application of the principle here involved.

The whole subject is very thoroughly and ably discussed by Robinson in his text-book on patents. Beginning at § 87 (p. 132) he sets forth the two ideas which are present to the mind of the inventor:—

"(1) The idea of an end to be accomplished.

"(2) The idea of a means whereby that end can be attained."

He points out that the invention, or that which can be the subject of a valid patent, lies *wholly* in the sphere of the *second* idea; and in the discussion the author brings out the fact that confusion may sometimes arise from failing to note that that which *was once a new means* (as a process of casting) becomes, after it is known, an element of a further *end to be accomplished*, as when it is desired to extend that old means to the production of

things which have not theretofore been made by it. In such a case we have two and only two possibilities; either (1) the desired application of the old means (process, apparatus or material) can be made without meeting any difficulty, and hence without devising any new means to overcome it; or (2) difficulties are encountered, rendering it necessary to invent new means in order to carry out the desired application. In the first instance no new invention is needed. In the second, the invention is in the *newly created means*. In neither case is it, or can it be, in the new application of the old means.

As an illustration of the first class is given by Justice Story in *Howe v. Abbott* (2 Story, 190): "It is the mere application of an old process and old machinery to a new use. It is precisely the same as if a coffee-mill were now used for the first time to grind corn."

O'Reilly v. Morse affords an illustration of a case where invention *was* needed in order to render the new application possible.

In *Electric Signal Co. v. Hale Co.* (114 U. S., 87):

"The thing patented is the particular means devised by the inventor by which that result is attained, leaving it open to any other inventor to accomplish the same result by other means."

Corning v. Burdén (15 How., 252):

"It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent be granted, and not for the result or effect itself."

Fuller v. Yentzer (94 U. S., 288):

"The invention, if any, within the meaning of the patent act, consists in the means or apparatus by which the result is obtained."

For further authorities in support of this proposition of law we refer the court to the text-book.

A "Double Use" Not Patentable.

The conclusion that claims 2, 4 and 5 are unpatentable will be reached by applying to them the well defined doctrine of "double-use."

The general rule is stated in innumerable decisions. A few citations will suffice.

In *Bray v. Hartshorn* (1 Cliff., 538) Clifford J. thus stated the rule:

"Where the claim rests merely upon the application of an old machine to a new use or to a new purpose, or upon *the application of an old process to a new result*, the patent cannot be sustained."

Justice Story, in *Howe v. Abbott* (2 Story, 190), said:

"The application of an old process to manufacture an article to which it has never before been applied is not a patentable invention. There must be some new process or new machinery used to produce the result."

Of course there may be invention *exercised* in applying the old process to the production of other articles, but in such case the claim should rest, not upon "the application of the old process to a new use," but upon the *new means* which rendered that application possible. This obvious distinction is recognized in the decisions. For instance, the Supreme Court in *Phillips v. Page* (24 How., 164), while holding that one may not claim the application of an old device to a new use, says that—

"if he had set up in his claim the improvements or *particular changes* in the construction of the old

machine so as to enable him to adapt it to the new use, and one to which the old one had not and *could not have been applied without those changes*, the patent might have been sustained.

"The utility is not questioned, and for aught there appears in the case, such improvements were before unknown, and the circular saw-mill for sawing logs, the first put in successful operation."

The claim was for "the manner of affixing and guiding the circular saw by allowing end play to its shaft, in combination with the means for guiding it," etc., and it was contended that this manner of guiding a circular saw for the important object of sawing logs was new.

So in the present case it is contended that the old manner of casting and shrinking out tubular articles was, by the patent in suit, applied for the first time to the production of sound-records. Admitting this to be true such application of this old method is not patentable.*

The general doctrine of double-use is too well established to be open to dispute, and complainant's counsel must therefore seek to bring the case within some recognized qualification of, or exception to, the rule.

There are cases where the application of an old thing to a new use has involved invention; as for example, the covering of electric conductors with gutta-percha, which involved the new discovery and utilization of the insulating properties of gutta-percha. Such cases, however, are not in reality exceptions to the rule, but

*We do not admit that it is even a *new use* of this old operation to apply it to the making of a sound-record. The material treated being metallic soap, and the article produced a hollow cylinder, the application of the operation is the same whether the surface of this cylinder be smooth or marked—in other words whether we cast a blank cylinder or one with a sound-record on it. Every sound-record is a "blank" as to part of its surface, and certainly one process makes all parts of the cylinder.

rather instances of patentable inventions coming under a different rule, namely, that the discovery of a *new property* in a known material, and its utilization for a practical purpose, may involve patentable invention. This last stated rule cannot apply where *the use itself* is not new. Thus, where the thing used is the process of casting, it is the same *use* whether the substance cast be glass, or metal, or wax. It is *the material* that is different; and where (as in this case) no specific material is mentioned, only "suitable material" being defined, even that distinction is absent. Therefore, in the case before us it cannot be agreed that claims 2, 4 and 5 propose even a *new use* of the old process of casting, much less a "non-analogous" use. This is particularly true when we bear in mind the casting of wax-like material into tubular forms for sound-recording tablets.

To continue this comparison we may suppose that Edison had discovered, in a material which had not heretofore been used in the sound-recording art, the new and desirable property of shrinking out of a mold (along with the other needed properties). We would then have a case analogous to the gutta-percha covered electric conductor. But even in that case, the invention would not be a *process* of casting and shrinking out sound-records, for the novelty would lie, not in that operation, but in the *new thing*, to wit, a sound-record made on the new material.

Analogous Use. *Brown v. Piper.*

The question whether a new use of an old device is patentable is sometimes determined by ascertaining whether the new use is *analogous* or *non-analogous* to the old use. Thus, in the gutta-percha-covered wire case (*Colgate v. Telegraph Co.*, 15 Blatch, 365) we find

an instance of a use of gutta-percha which was not analogous to any previous use thereof. But in addition to the question of analogy in the use, we must note that there was no pretense in that case that it was a *new process* to apply gutta-percha to an electric conductor. The use of a *new material* did not confer novelty upon the *process* of coating the wire, and this decision could not possibly support the view that the use of a new material (even if one were disclosed) or a newly discovered property of an old material, could confer novelty upon the *old process* of casting and shrinking. Much less could such process be regarded as novel when the only mention made in the patent of any material is a general class, which it had been customary to cast into cylindrical forms in this very art, and whose property of shrinkage was well known.

Assuming, however, that the case at bar presents the question whether the use of the old process of casting and shrinking out for the production of sound-records is or is not analogous to previous uses of that process, we submit that such question is readily settled in the negative. What can present a closer analogy to the casting of a sound-record than the casting of a sound-record cylinder? The analogy is even closer than that of the use of a coffee-mill to grind corn; because in the latter case the materials subjected to the grinding operation were different, in the former the material subjected to the casting operation is the same.

A decision strictly pertinent, because it deals with a case of analogous process, and not with one of analogous material or an apparatus, is found in 91 U. S., 37, in the case of *Brown v. Piper*.

The invention was a process of preserving fish and other articles for the market, which process, as stated in the claim, consisted in—

"Preserving fish or other articles in a close chamber by means of a freezing mixture having no contact with the atmosphere of the preserving chamber, substantially as described."

This was undoubtedly a *new use* of the old process of producing low temperature by means of a freezing mixture. The nearest prior approach to such use was in a corpse-preserver, which the court held was the application of the requisite degree of cold, as called for in the patent. Therefore, the court held that what the patent covered was—

"Simply the application by the patentee of *an old process to a new subject*, without any exercise of the inventive faculty, and without the development of any idea which can be deemed new or original in the sense of the patent law. The thing was within the circle of what was well known before, and belonged to the public. No one could lawfully appropriate it to himself and exclude others from using it *in any usual way for any purpose to which it may be desired to apply it.*"

This is undoubtedly the present case. It is possible that, in other claims of the patent, we might find the development of new ideas which are "original in the sense of the patent law," and whose development involved the "exercise of the inventive faculty;" but in the claims in suit we have nothing more than "the application by the patentee of an old process to a new subject," there being no pretense of novelty specified anywhere but in the subject (i. e., sound records) produced from an old mold by the old process of casting and shrinking out.

Leroy v. Tatham.

From a reference made in the deposition of Mr. F. L. Dyer in the companion suit (No. 1103) it is supposed that complainant will refer to the case of *Leroy v. Tatham* (22 How., 132), in which the Supreme Court sustained a patent for the manufacture of lead pipe in continuous lengths by the operation of machinery which pressed the lead out of the vessel through an orifice and around a suitable core. The lead, in passing through the orifice, was divided by the bridge-piece which supported the core in the orifice, and the invention was based upon the discovery (and utilization) of the very remarkable property possessed by lead, when at a high heat and under great pressure, of uniting perfectly, after separation, just as if its parts had never been separated. The patentable basis of the invention was thus stated in the specification of the patent:

"We have found from experience that lead and some of its alloys, when recently become set (or in a condition just short of fluidity), being still under heat and extreme pressure in a close vessel, will reunite perfectly after separation of its parts, and "heal" as it were by the first intention as completely as though it had never been divided."

This was a very remarkable discovery, and its application to the manufacture of pipes in continuous lengths was patentable for the reason that it was a new means for making lead pipe, whose production involved patentable discovery and invention. No suggestion was made in the case that the manufacture of pipes by subjecting lead or any other material while in a solid state just short of fluidity to heat and pressure and causing the severed parts to unite as specified was previously known. The contention in that case was that the

patent was void because it involved merely the use of *old machinery*. In a previous suit on the same patent (reported in 14 How., 156) a reference had been made to the old macaroni press; but the use of that device did not involve the same process, there being in the manufacture of macaroni, no heating of the dough to near the melting point, and indeed heat having upon dough just the contrary effect to its effect on lead (hardening instead of softening it). The macaroni press was not referred to in 22 How., where the patent was sustained; and indeed the patent was sustained for the express reason that the machinery employed, while not new in all its parts, was *new in its combination, and was made part of the claim*.

As to this the court held:

"If it be admitted that the machinery, or a part of it, was not new when used to produce the new product, still it was so combined and modified as to produce new results, within the patent law. *One new and operative agency in the production of the desired result would give novelty to the entire combination.*"

And the court refers again to "the complicated and powerful machinery used to produce the result" and said that:

"It is only necessary to examine the machinery combined, to see that its parts are *dissimilar to others in use.*"

After reciting the six elements *mentioned in the claim** the court said:

"It is rare that so clear and satisfactory an explana-

*The claim was as follows:

"The combination of the following parts above described—to wit, the core and bridge or guide piece—with the cylinder, the piston, the chamber and the die, when used to form pipes of metal under heat and pressure in the manner set forth, or in any other manner substantially the same.

tion is given of *the machinery* which performs the important functions above specified."

If then, complainant wishes to invoke the case of *LeRoy v. Tatham* it can only do so to support those claims of the patentee which include as elements *the new means or combinations* which Edison has devised and which are disclosed in the patent, to wit, the inverted mold kept at a low temperature when the wax is introduced, and the means for introducing the wax upward through the bottom of the mold.

So far as the evidence shows *these means* were new, and were what Edison invented for the purpose of overcoming the difficulties which he met in his attempt to produce satisfactory duplicate records by casting. The idea of lifting out the record after shrinkage was not a thing which *overcame* difficulties, but on the contrary was a desired result which *involved* difficulties—not slight difficulties, but (if we accept Mr. Edison's testimony) "enormous difficulties."

Another case which well illustrates the doctrine under consideration is found in 110 U. S., 490 (*Pa. R. R. Co. v. Locomotive Co.*).

The invention (briefly described) was the application to locomotives of the swinging truck previously employed with railroad cars. The patent was sustained in the court below (1, B. & A., 470) upon the ground that the combination with a locomotive engine of the swinging pilot truck was new, and produced a new and useful result in that it permitted the driving wheels to remain properly upon the track, while permitting the body of the engine to shift in turning curves. Undoubtedly this was a *new* use of the swinging truck, and a *different* use, because cars have no driving

wheels, and the conditions of applying a swinging truck thereto were different from those of the application thereof to a locomotive.

The Supreme Court declared the patent void, saying:

"It is settled by many decisions of this court which it is unnecessary to quote from or refer to in detail, that the application of an old process or machine to a similar or analogous subject, with no change in the manner of application, and no result substantially distinct in its nature, will not sustain a patent, *even if the new form of result has not before been contemplated.*"

Just what is the effect of the qualification expressed by the words "no change in the manner of application and no result substantially distinct in its nature" need not be closely inquired into, because no change in the manner of application of the old casting process, and no result substantially distinct in its nature are set up in the claims involved in this suit. In those claims the only conditions presented are (1) the "old process" (casting and shrinking out) applied to (2) "a similar or analogous subject" (wax-like or other suitable material), in (3) an old mold.

The court cited and followed three English cases which presented instances of the application of old contrivances to new uses. One of these was a process of finishing yarns of wool or hair, which process had previously been applied to cotton or linen, regarding which the court held:

"there must be some invention in *the manner* in which the old process is applied" "here there is no novelty in the mode of application" "but merely the application of a known process by a known means to *another substance.*"

In the case at bar we have merely the application of a known process by a known means (cylindrical mold) to the *same* substance previously treated by that process. The only difference is the character of *the surface* of the mold.

See also *Miller v. Force* (116 U. S., 22).

Western Elec. Co. v. Ansonia Co. (114 U. S., 447).

It follows that the claims sued on are void in that they define no new process, but at the most define only the application of an old process to an old subject (wax-like material) for the purpose of obtaining an old result (tubes of said wax-like material), the only alleged distinction being in the nature of the surface of the mold.

These considerations apply also to claim 1, because, so far as it covers any *process*, it is the old process of molding. The shrinkage is always that which occurs in casting the particular material used, and the claim, in specifying the drawing together of the threads on the surface of the record, merely specifies what would inevitably take place, whether specified or not.

Decisions of the Circuit Court of Appeals in this Circuit.

On the subject of analogous art or analogous use, the Circuit Court of Appeals in this circuit has clearly stated its views. Thus, in *Jones v. Cyphers* (126 F. R., 753), certain patents for system of heating and ventilating were set up against a patent for an incubator, and it was objected that the prior patents did not relate to an analogous art. To this the court said:

"Whether houses and incubators are or are not in the same class is unimportant. The patent in suit deals with the problem of ventilating an incubator; the two earlier patents with the problem of

ventilating a house or a room; and we are clearly of the opinion that the devising of systems of ventilation belongs to a single art, whether such systems are to be applied to a hospital, a sewer, or ship's hold, a cold-storage box, an incubator, or any other structure where circulation of air is sought to be secured."

Ventilating is ventilating, to whatever structure it may be applied. So casting is casting, whether the thing cast be a glass tumbler, a printing roller, or a sound-record. Certainly casting wax into a tubular form to be used as a record cylinder is the same operation as casting the same wax into a tubular form to be used as a sound-record; and it cannot possibly be patentable invention to do to a wax-casting having a marked surface what has been done to one having a smooth surface, i. e., take it out of the end of the mold when sufficiently cooled and contracted.

The court, in the above decision, cited their decision in *Briggs v. Duell* (93 Fed., 972), wherein it was held that planing ice was an analogous operation to planing wood. In the last cited decision the court referred with approval to *Stearns & Co. v. Russell* (85 Fed., 218, C. C. A. Sixth Circ.), wherein it was held that the use of a pneumatic contrivance for dipping pills was analogous to the use of a similar contrivance for lifting sheets of paper.

Macdonald the First Inventor of a Practical Casting Process.

On pages 34-44 of this brief we have referred to Edison's testimony showing that in October, 1888, he discarded the casting process, and that this was after he had evolved *all the ideas on the subject which the*

claims sued on contain. He testifies that he dropped the casting process because of the existence of "enormous difficulties," and of certain specified defects and "innumerable other defects." This plainly says that the experiments relating to casting were, at the time they were laid aside, unsuccessful.

In view of the fact that Macdonald invented his successful casting process in 1896, and had it in practical operation in 1899, it is important to ascertain when, if ever, Edison arrived at a *practical* casting operation. For that purpose we will take his own statements.

Certainly his experiments were wholly unsuccessful, in 1888, when the pressing process displaced the attempts at casting. Edison says that "there were enormous difficulties in the way "of doing it (Q. 18). After enumerating some of the defects he says there were "innumerable other defects" (Q. 40); and says that the pressing process was preferable "until we could reach a point in the art whereby all the defects of the casting process were eliminated." This pressing process came on the scene in October, 1888. The defective condition of the casting experiments at that time is further shown by the fact that Edison and Aylesworth, when recalled, both testified that the *pressing process is inferior to the casting process.* (C. R., 264 and 269.)

We ask the court to note particularly that from 1888 down to the present day, so far as the evidence shows, *Edison did not invent a single improvement in the casting process, or take a single step in advance of the point reached by him in 1888.* So far as he is concerned the art stopped there.

In X-Qs. 102, 103 (p. 157) he is asked to specify the "enormous difficulties" which barred the way to the use

of the method defined in claims 2-6 of his patent, and to state *how he overcame them*. All he can say is:

"Well, as time went on we found out the cause of all these troubles. We kept getting *better materials*, and getting conditions whereby we could avoid them [the troubles], not pouring the materials in so hot, and cooled them down to different stages, so that these decomposition products which gave gas would cease to give them off, and those things which experience gives."

Edison admits that the difficulties were not removed until Aylesworth took hold. Thus, in answer to 104 X-Q. he says that they never did get rid of these difficulties to the extent of avoiding a large number of discards from the casting process "up to the time that Mr. Aylesworth got his material."

Having said on direct (Q. 40, supra) that he dropped the casting process "until we could reach a point where all the defects of the casting process were eliminated" he was asked (X-Q. 105) when that point was reached. His reply (p. 158) was—

"Well I think—I believe it was somewhere *about the date of my application on this casting process*, we got to a point where we were *pretty near* being able to compete with the mechanical process."

And he goes on to say that he "dropped it and gave it all over to those two experimenters" (Miller and Aylesworth).

This is equivalent to saying that Edison never did perfect any casting process; that about the time of his application (long after Macdonald's process was in actual use) he was "pretty near being able to compete

with the mechanical process," and that then he "*dropped it and gave it over to those two experimenters*" Miller and Aylesworth).

Claims 2, 4 and 5 of this suit specify an alleged process made up of two operations, (1) *casting* the material into the mold (i. e., introducing *molten* material) and (2) shrinking out the cast record. The serious difficulties and defects which Edison refers to related to the first operation, and seemed to result from the melting of the material. With reference to the second operation it is evident (as we have many times asserted) that the shrinking out of the record is a mere matter of using a material which in cooling down from the melting point to normal temperature, contracts sufficiently away from the mold to allow it to be taken out. Edison's caveat of October 26, 1888 (C. R., p. 276), shows that this is not a matter of process, saying that a blank cylinder of any material, which is plastic when hot, after being heated and expanded against the mold and allowed to cool,—

"will contract sufficient away from the record to allow of its being taken out."

Clearly, if there be sufficient shrinkage resulting from the slight reduction of temperature employed in the pressing process, there will be much more than sufficient resulting from the greater reduction of temperature incidental to the casting process. Hence it is doubly evident that, in respect of the operation of shrinking out, which is made a part of these claims, we have simply the question of selection of a suitable material.

Moreover, we have Edison's explicit statement, made on p. 138 in answers 4 and 5, that the abandonment of

split molds was due to the "discovery" that there were "certain materials which would shrink enough" to clear the mold. What were those materials (or some of them), and when were they discovered? None is described in Edison's patent in suit, because, with that specification in his hand he cannot name any (p. 156, Q. 98). None is described (so far as appears) in any of his other patents (X-Q. 100). In this case we know of only two compositions which have been used practically for molding sound records, namely, the composition of Macdonald's patent, No. 606725 (D. R., p. 81, Q. 5), which is used by defendant, and Aylesworth's secret composition, which is used by complainant. Macdonald testifies that he knows of *no other patent which gives a formula for manufacture of soap compositions for sound-records* (D. R., p. 82, Q. 12) ; and, as we have seen, Edison could give none.

Hence, we are likewise without evidence as to when (*if ever*) Edison made the "discovery" of a material which satisfied the conditions as to shrinkage, along with the other necessary conditions. If now, we look into Shultze-Berge's note-book,* we find after a number of pages occupied with entries relating to the making of molds by electroplating, a series of experiments with waxes (beginning on p. 282, C. R.).

Miller had told us (C. R., p. 87, Q. 57) that when he was in Edison's laboratory between 1887 and 1893 he saw Shultze-Berge plating master records by the vacuum process, and listened to records which he was told were molded records, and "which were *brown* on the outside and *white* inside." These were records made with a peculiar brown wax, backed up with par-

*Edison says that Shultze-Berge was in charge of the experimenting on this subject (p. 139, Q. 9).

affin, which is white (Wangemann, C. R., p. 70, X-Q. 75; Miller, p. 98, X-Q. 116).

Now in Shultze-Berge's notebook under date of March 21, 1890 (p. 282), we find the entry:

"New wax (brown-yellow, brittle)" and also "paraffin," and beginning on p. 285 a series of experiments using both "wax" and "paraffine."

On p. 289, under date May 23, 1890, we find a reference to "Aylesworth's new square wax cake." On p. 288 (June 2) we have a "brown wax shell." The unsatisfactory results are stated. These experiments run on through eleven pages, until (p. 297) on September 6 is another "new" wax. In all these experiments the thin "wax" shell is backed up with paraffin, and the notes of results show that they were unsuccessful.

On page 300 (Oct. 9, 1890) is an isolated experiment with "hard wax at 390°," which was "cast slowly" with the result that the "cylinder takes hardly anything from record but *sticks to mould*."

The next entry shows an immediate return to "duplicating wax" now used with "rubber core and talcum and castor oil," with entries of the usual kind, namely "cylinder sticks," "a string of air holes," "strong scratch," "broke; air holes and running out," etc., etc.

Thus we see that all through the year 1890, Edison's assistant Shultze-Berge was experimenting on waxes and the conclusion of his work left the subject with negative results. This tends further to prove that, in and after 1888, when Edison dropped the casting process, the discovery of a material which would satisfy the condition of shrinkage (while fulfilling the other essential conditions) had not yet been made. Inasmuch as the testimony does not show that it was ever made by him (and indeed Edison does not claim that it was) we

have nothing anterior to Macdonald save unsuccessful experiments, long abandoned, and which did not result, *prior to his invention*, in even so much as an application for patent.

On this state of facts Macdonald is the inventor of any patentable invention which may be common to his process and that of Edison.

Assuming then that either Macdonald or Edison is the inventor of a process which consists of the two operations (1) casting melted sound-record composition into the mold (2) shrinking it out by cooling, the proof shows that Macdonald invented a successful process embracing these operations in 1896, and was making sound-records by it in 1899. Edison's date of reduction to practice is that of filing his application (May 8, 1900). He cannot, under the settled rule of law, carry his date back to his unsuccessful experiments of 1888.

In *Campbell Co. v. Duplex Co.* (86 Fed., 315-331), the suit was on the Stonemetz patent, and the defendant was operating under the later Cox patent, of which the court said:

"The later patent to Cox creates an equally strong presumption of the novelty and utility of *his* construction. *Ney v. Manufacturing Co.*, 16 C. C. A., 293, 69 Fed., 405. And this presumption is verified by its successful working and its favor with the craft."

Commenting on the delay of ten years by the owners of the Stonemetz patent, in reducing the invention to practice, the court said that it was *fatal* to his claim of invention, quoting the following passage from the decision of the Supreme Court in *Clark Thread Co. v. Williamantic Linen Co.* (140 U. S., 489):

"A conception of the mind is not an invention

until represented in some physical form, and unsuccessful experiments or projects, abandoned by the inventor, *are equally destitute of that character.* These propositions have been so often reiterated as to be elementary."

In *Wright v. Postel* (44 F., 352) the court said:

"It is therefore the duty of inventors to use reasonable diligence in reducing their conceptions to practice, and *applying for patents when desired.*"

This decision was cited and followed by the Circuit Court of Appeals (Sixth Circuit) in the leading case of *Christie v. Seybold* (55 Fed., 69, 75), and also in *Covert v. Covert* (106 Fed., 183-185).

Christie v. Seybold.

The entire law on this subject was reviewed in *Christie v. Seybold*, *supra*, which was an appeal from the U. S. Patent Office. The Court affirmed the decision of Mr. Commissioner Mitchell, so that the doctrine may be said to have the support of the highest authority.

The controversy was between two parties one of whom (Christie) was a patentee, and the other an applicant for patent. The question was which of the two should be regarded as the inventor of what was common between their two devices. The situation, therefore, was similar to that presented in this case.

The discussion of the question at issue begins on page 75 of the Reporter (Vol. 55), where the court states the well-established doctrine of *Agawam Co. v. Jordan* (7 Wall., 583) :

"The settled rule of law is that whoever *first perfects a machine* is entitled to a patent and is the real inventor, although others may have previously *had the idea, and made some experiments*

toward putting it into practice. He is the inventor and entitled to the patent, who, being an original discoverer, has first perfected and adapted the invention to *actual use*."

This language applies forcibly to the present case. Macdonald invented his process and reduced it to practice as early as 1896, and he put it into actual use in 1899. He invented not only the *first* method of casting sound-records, but *the only casting method in use to-day*.

Edison comes to the Patent Office in 1900, basing his claim to a patent upon what he did in 1888, twelve years previous. He does not pretend to have "perfected" the process then or at any time. All that he claims, upon his own testimony is that he "had the idea" (it was an "ideal" thing to do) and "made some experiments towards putting it into practice." He did not reach that point, but on the contrary admits the existence of "enormous difficulties" in the way, in consequence of which he took up the "pressing process," filing a caveat for said pressing process in 1888, and an application for patent for it in 1898.

Edison can point to no use of the process of his patent in suit. In order to be able to say that it is even operative, he had to have trials made *after this suit was begun*, namely, in the spring of 1903 (C. R., p. 125, Qs. 69, 70).

The court also cited *Whitely v. Swayne* (7 Wall., 685), quoting the statement:

"He is the first inventor and entitled to the patent who, being an original discoverer, has first perfected and adapted the invention to *actual use*."

This applies to Macdonald, who was the first to make actual use of any method of casting sound-records, al-

though he never made the absurd claim that he was entitled to patent the shrinkage of the material.

This rule (as the court said) had no exception until after Judge Story's decision in *Reed v. Cutter* and the amendment to the patent act made in 1836, introducing the doctrine of "diligence in adapting and perfecting" the invention.

The exception is that the person who is second in reducing the invention to practice "may date his patentable invention back to the time of its conception, if he connects the conception with its reduction to practice by reasonable diligence on his part *so that they are substantially one continuous act.*"

It will be seen at once that this exception does not concern us. There is no pretense at all that Edison's "ideal" of 1888, and the experiments from which he turned aside to take up the "pressing" method in 1888 because of the "enormous difficulties" developed, were connected with a later reduction to practice by reasonable diligence or by a continuous chain of effort, or in any way. Indeed, there is nothing to indicate a reduction to practice by Edison at any time, until his "constructive" reduction to practice in May, 1900, by filing an application for patent.

The court also stated the well settled rule that:

"The burden is on the second reducer to practice to show the prior conception and to establish the connection between that conception and his reduction to practice by proof of due diligence."

The court also shows that this diligence must not only be continuous, but it must date continuously *from a time anterior to the conception of the other party* (in this case from a time anterior to 1896). The entire de-

cision, and that of Mr. Commissioner Mitchell in the same case (54 O. G., 957), which it affirms, and which (as the court says) "cites all the authorities and is quite convincing on this point," give clear statements of the law on this subject, and show how impossible it is for Edison by this patent to interfere with defendant's use of its own patented process.

We will only add that nothing short of absolute disability (hopeless poverty, insanity and the like) has ever been held to excuse a delay of twelve years. Edison has no *excuse* to offer for this delay. There is, however, an excellent *reason* for it, namely, that Edison did not make any invention in casting records in 1888, or at any time before Macdonald's process was invented, and did not *think* he had made any. Had he even thought so he would have come promptly to the patent office. He has never been backward in doing so.

All that Edison invented in and about 1888, and all that he thought he had invented, was the new method of *making a mold*, which he patented in his 1892 patent No. 484582, and the *use* of that mold by the *pressing* method, subject of a caveat in 1888 and an application for patent in 1898. He made no improvement in any process of *casting* a sound-record in that mold, until, at some undisclosed date, he invented the details of procedure set forth in the specific claims of the patent in suit.

Abandonment.

The facts prove abandonment regardless of defendant's equities and intervening rights as presented in the last preceding section of this brief.

Complainant seeks by this patent to suppress an industry created, perfected and practically used before the application for said patent was filed,

The history of the alleged invention of this patent, as revealed by the testimony, is briefly as follows:

At least as early as 1888, Edison and his assistants possessed all the information which this patent in suit discloses (so far as the claims sued on are concerned). They had performed the operation of casting records in continuous cylindrical molds using the "waxlike" material referred to in the patent in suit. That operation, of course, involved everything recited in the claims sued on, since those claims recite nothing more than the steps of melting, pouring into the mold, and cooling, with the necessary results of cooling, i. e., setting and shrinkage of the material. The operations included also the proper allowance for shrinkage, as we see that Shultze-Berge had made some computations to determine what it should be. (C. R., p. 123, fol. 489; pp. 282, 283 and elsewhere.)

Thus we have every scrap of information relating to the casting of sound-records which is contained in the claims here involved. Those claims and every word of the supporting description could have been presented to the patent office in 1888.

But Edison admits that his work at that time in *casting* records, was purely experimental, and was *unsuccessful*. He says that casting records in a cylindrical mold, cooling, and removing from the end of the mold was an "ideal" thing to do, but that there were enormous difficulties in the way of doing it. (Q. 18, p. 140.) Thereupon he set aside the casting process for a *pressing* process. (P. 139, Q. 8; p. 144, Q. 41.)

Here then, were certain experiments in 1888, carrying the process *just as far as the patent in suit carries it, but not carrying it to a practical result*. We then see Edison passing on from these unsuccessful experiments in casting to the preferred "pressing" process, for which

Edison *filed a caveat* on October 26, 1888 (p. 276). This caveat states that, after expansion of the blank "it will contract sufficient away from the record to allow of its being taken out."

Here then was an abandonment of the unsuccessful experiments of 1888, and a clear admission that the process *as it existed then would not result in practical records*. That process, *as it existed then*, which is exactly as set forth in the claims now sued on, left "enormous difficulties" yet to be solved. Manifestly, there could be no patentable (because no practical) process of casting records unless it included means for avoiding these "enormous difficulties."

In that year (1888) Edison had pending in the U. S. Patent Office the application for a method of casting records filed January 5, 1888 (split-mold patent).

The process described in that patent was the same process of melting, casting and cooling, with all the attendant shrinkage of the "waxlike" material. This application was allowed August 13, 1890, and was forfeited by non-payment of the final fee. It was *renewed* March 30, 1892, and the patent, No. 484582 was granted October 18, 1892 (D. R., pp. 180-186).

Thus, for four years prior to the renewal of this application Edison had *all the information regarding the casting of records which the patent in suit discloses*, including the amount of allowance which should be made for the shrinkage of the wax-like material.

The fact that Edison renewed this application in 1892, causing it to be issued and published as a means of *casting* sound-records, making no mention of withdrawing the record when cooled from the end of the mold, or of making a proper allowance for shrinkage, confirms the proposition that these expedients, *which he had then*

known for four years, produced no results which were not obvious to persons skilled in the art of casting, and not necessary to be disclosed.

The renewal of this application in 1892, making no mention of these common shop expedients, although known to Edison for at least four years, is a clear *abandonment* thereof as the basis of claims for the casting of sound-records. It is an extraordinary proposition, that eight years more can be allowed to pass and another application for patent be then filed and granted, differing in no respect from that of 1888, except in these common shop expedients, especially as these did not then, and hence cannot now, overcome the "enormous difficulties" which stood in the way of successfully casting sound-records.

But that is not all. On March 5, 1898, Edison filed the application for patent for his method of "pressing" sound-records by inserting a solid blank in the mold, expanding it by heat, and then cooling. This application matured into patent No. 713209, granted Nov. 11, 1902, upon which the companion suit No. 1103 is based.

Thus, although this patent issued later than the patent in suit, the application therefor was filed *more than two years earlier*. The court will see that claims 2, 3, 4, 5, 6 and other claims, of patent No. 713209 recite the removal of the molded record from the mold by shrinkage and *by a direct longitudinal motion*, and hence differ from the claims in suit (2, 4 and 5) solely in that *pressing* instead of *casting* is specified as the method of forming the record.

This is another clear indication of abandonment of that expedient as part of a *casting* process, and another fact forbidding the grant of a subsequent patent therefor.

The court will note that in patent No. 713209 *nothing is said about allowing for the shrinkage of the record*. Considering that Edison had known of the expediency of allowing for shrinkage for at least ten years, the fact that he omitted all mention of it in this application clearly indicates that he recognized it to be an obvious and well-known expedient, which it was not necessary to mention.

In any event, this second opportunity to mention it, and to make a claim for it, is a further indication of abandonment.

After the application for No. 713209, two years more elapse, during which Macdonald's process (consisting of *new means which do successfully overcome the enormous difficulties* which caused Edison to pass from the casting to the pressing process in 1888), was invented, perfected, and put to practical use.

Finally, on May 8, 1900, Edison filed the application for the patent in suit, and on February 5, 1901, it was granted.

Edison does not even now pretend that this patent discloses the means whereby the "enormous difficulties" which rendered his experiments of 1888 unsuccessful, were overcome; but on the contrary testifies that *those difficulties were overcome by a specific process and apparatus invented and patented by Miller and Aylesworth* (patents Nos. 683615 and 683676), and by a *secret composition*, known herein as "duplicating wax" (C. R., p. 149, Q. 68).

This history presents a case of inconclusive and unsuccessful experiments. If these experiments yielded any results which could be the subject of a valid patent, it is clear that the right thereto would have been forfeited by a "wilful and negligent postponement of the

claim" for a period of twelve years, during which time defendant's process was perfected and put into use. No excuse whatever is offered for this delay (*Kendall v. Winsor*, 21 How., 322).

Manifestly, these experiments of 1888, cannot be made, twelve years later, the basis for a patent which would cover broadly *any and every process whereby sound-records are cast in a cylindrical mold*. This is the real scope of these claims, because every molded record, *if it fits any talking machine*, would infringe claim 1 (and, of course, every commercial record does fit some machine); and because every cast record which is taken out of the end of the mold would infringe claims 2, 4 and 5 (and, of course, every cast record *must be* taken out that way, if taken out at all). Mr. Walker, in his textbook on patents (4th Ed.), states the rule concisely (§91), saying:

"Abandonment is also proved by evidence that the inventor is chargeable with laches, relevant to applying for a patent. Long delay constitutes laches, unless there was some reason which rendered that delay consistent with an expectation to finally secure a patent. Extreme poverty of the inventor is such a reason; but poverty which was not sufficient to prevent the inventor from securing patents on other inventions, or from spending money for an education, is not such a reason."

Other exceptions noted in the decisions cited by the author have no application to the case at bar.

In *Kendall v. Winsor* (21 How., 322), the Supreme Court discussed the effect of concealment and long delay of an inventor, stating that the inventor who negligently postponed his claims did not come within the

policy of the Constitution and acts of Congress; and announced this rule:

"Hence, if during such concealment, an invention similar or identical with his own should be made and patented, or brought into use without a patent, the latter could not be inhibited nor restricted upon proof of its identity with a machine previously invented and withheld and concealed by the inventor from the public."

And further the court said that an inventor

"may forfeit his rights as an inventor by a wilful or negligent postponement of his claims."

In *Consolidated Fruit Jar Co. v. Wright* (94 U. S., 92), the facts as stated by the court were that "the invention was completed in 1859. The application was made on the 15th of January, 1868. The intervening period was between eight and nine years." The court, after passing on the defense of two years public use, take up the question of abandonment by neglect and delay, saying: "No sufficient reason is disclosed in the record why the application for patent was not made earlier." During this period of delay other devices of a similar nature had come on the market, and the court held that the defense of abandonment had been made out, saying:

"The supineness of the patentee is unexplained and inexcusable. A principle akin to the doctrine of equitable estoppel arises."

In a number of cases abandonment has been deduced from the long delay of an inventor in renewing an application which has once been filed and rejected.

Rifle & Cartridge Co. v. Arms Co. 118 U. S., 24.
Planing Mach. Co. v. Keith, 101 U. S., 484.

Manifestly the controlling fact is the same, whether the inventor has once manifested an intention of claiming a patent as in the cases above cited, or, as in the present case, has remained silent for a long period of time manifesting no intention to claim a patent, but indicating a contrary intention, not only by the long delay, but by making applications for patent for similar subjects. Thus in the Rifle case *supra* the delay of the patentee before renewing his application was a matter of nine years, and that was held to be abandonment. Judge Shipman, who decided the case at circuit (his decision being affirmed by the Supreme Court), quoted from *Kendall vs. Winsor* the passage declaring that a person

"may forfeit his rights as an inventor by a wilful or negligent postponement of his claims, or by an attempt to withhold the benefit of his improvement from the public until a similar or the same improvement should have been made and introduced by others,"

and added:

"If there was no purpose on the part of Cochrane to withhold his improvement from the public, there was a negligent postponement of his claims until after other inventors had acquired equities which it seems unjust to destroy."

And the learned judge quoted with approval the following pertinent language from Judge Woodruff's decision in *Consolidated Fruit Jar Co. v. Wright* (12 Blatch, 149):

"If an inventor without substantial reason or excuse, abandons the use of his invention, and for nine years sleeps on his rights, and in the meantime others in good faith employ their industry, skill and money in producing the same thing, and give the public the benefit thereof, putting it into extensive

use and on sale, such a state of facts not only warrants the inference of abandonment by the first inventor, but it also creates, as between him and the others, the same equity as would arise if such others had gone further and taken out a patent."

The delay of the patentee in the case at bar was longer, and the circumstances more clearly indicative of abandonment, than in the cases cited. To the circumstances already commented upon there is another, which appears conclusive, namely, that Edison set aside the casting process in 1888, not as a completed invention which he intended to patent, but as a scheme involving enormous difficulties. The intention to patent was clearly abandoned at that time, and *every pertinent act for a period of twelve years confirmed it.*

Further conclusive evidence of this is found in affidavits of Edison and Wurth filed in the application for patent, No. 713,209, and discussed in our brief in suit No. 1103.

The Specification is Fatally Defective.

The law requires that the specification shall disclose the invention in such full, clear, concise and exact terms as to enable any one skilled in the art to which it appertains to make and use the same (R. S., Sec. 4888).

We have seen from Edison's testimony that the accomplishment of what is set forth in the claims in suit (i. e., casting a sound-record in, and removing it from, a continuous mold) *depended upon the discovery of a material having certain properties essential to the end in view* (Edison, p. 146, Q. 52; 147, Q. 60; 148, Q. 66).

We have seen from Schulze-Berge's notebook (pp. 288-306), that the persistent search was for a material having the desired properties, and that the results for a whole year were air-holes, streaks, cracking, sticking to mold, warts and the like.

We learn from Edison (p. 150, Q. 69) that different compounds have

"different properties, are accompanied by different phenomena; some attack the mold violently, some contract out of round, some stick to the mold, some actually expand when they ought to contract, and there is no possible way to know how one of these mixed compounds is going to work under any conditions until you have tried the experiment; the melting points vary, and they vary in all possible ways."

The whole of this long answer is pertinent and closes with the statement that

"In fact, it is a very long, tedious problem, in experimenting with these materials, to obtain what is desired."

This puts the case very clearly. The "problem" was to get a good record and to get it safely out of the mold. That was *not the invention Edison made*, but the *problem to be solved*; and the attempt to solve the problem was made "in experimenting *with these materials, to obtain what was desired.*"

Certainly then the specification does not disclose the solution of the problem unless it discloses the material which possesses these properties. On that essential matter it is *absolutely silent*. Instead of giving the solution of the problem and claiming that, the claims *cover the problem as a solved problem*. This they could not do even if the solution was given; but here we have the extraordinary case of a patent claiming a solved problem without furnishing any solution whatever. Complainant has solved the problem, and is forming cylindrical sound-records in a mold and taking them out; but it is employing the special means of the Miller and Aylesworth patents, and the peculiar secret composition known as "duplicating wax."

Defendant has solved the problem—long before complainant had done so—and has been for many years casting sound-records in molds and withdrawing them therefrom; but it is doing this by means of Macdonald's superheating process which permits the desired result to be attained with the ordinary sound-record composition familiar to the art and specifically that disclosed in the Macdonald patent of 1898, No. 606725 (D. R., p. 274).

That the patent is absolutely silent as to the matter declared by the patentee to be essential is not disputed by any one, but, on the contrary, is distinctly and emphatically proclaimed by the patentee himself. In the first place he admits that what made "the shrinking out of continuous molds of standard length a *possibility*" (p.

148, Q. 66), was that Miller and Aylesworth had discovered a material which had very fine properties for the purpose. Then, after emphasizing (p. 154, X-Qs. 82-86) the need of a special material with special properties, he testified as follows (p. 156) :

"98 X-Q. In answer to Q. 5 you spoke of discovering materials having a sufficiently high coefficient of expansion to contract and permit of withdrawal from a continuous mold. Please mention some of those materials?

"A. Well, I should have to look up my note books."

"99 X-Q. Can't you recall any of them off hand?

"A. They were mixtures of soaps and waxes.

"100 X-Q. You have several patents relating to mixtures of metallic soaps for recording materials. *Do those materials come within that class?*

"A. Well, I would have to look up the patents. *I think some of them would be all right, have sufficient contraction to permit of the drawing out of the record without abrasion.*"

Nothing could be more conclusive. The patent in suit was in his hand. The questions immediately preceding those above quoted (X-Qs. 96-97) were directed to it. *The inventor himself cannot by referring to it mention any material* "having a sufficiently high coefficient of expansion to contract and permit of withdrawal from a continuous mold," but would have to look up his note books. His succeeding answers (101) referring to the "different material" used at the present day "that has very good properties and produces few discards and gives off very little gas," and (104) referring to "the time that Mr. Aylesworth got his material," show that Aylesworth's secret composition is the only one known to Edison which fulfils the desired conditions.

That the patent in suit is fatally defective in being made to contain less than the whole truth relative to the alleged invention or discovery, is thus established by the clear and distinct testimony of the patentee himself.

The proposition of law here involved is elementary and needs no citation of authority beyond the plain requirement of the statute. We will therefore cite but a few cases.

In *Sewall v. Jones* (91 U. S., 171-185) the Supreme Court thus states the rule:

"The principle is this: the omission to mention in the specification something which contributes only to the degree of benefit, provided the apparatus would work beneficially and be worth adapting without it, is not fatal, while the omission of what is *known to be necessary to the enjoyment of the invention is fatal.*"

In the strongest and clearest language Edison testifies that the prime essential to the enjoyment of the invention was a material having certain properties. The omission to specify such material is fatal.

In *Miller v. Machinney Last Co.* (105 Fed., 523), the Circuit Court of Appeals (First Circuit), held that the words "at or near the bottom of the last" were not sufficiently definite to define the location of an essential part. The court said:

"Consequently, there is not enough in the patent to meet the requirements of the statute pointing out the method by which a successful last *can be made in accordance with the claim* and no useful last without a holder was ever made until the respondent came into the field."

That the omission of anything material to the utility

of the invention described is a fatal defect, see *Carr v. Rice*, 1 Fish., 204, and *Schneider v. Thill*, 5 B. & A., 565.

The last cited case is particularly pertinent because of the facts presented. The patent set forth a result desired, namely, that the burner of a lamp should operate properly without the use of a chimney, and by means of the shade alone. The facts were that such result would not be attained

“unless a shade having certain peculiarities of form be used. What those peculiarities are the patent omits to disclose, and the omission is fatal to its validity.”

That the specification must so describe the invention that the result can be accomplished without further investigation or experiment, see

Neilson v. Harford, 1 Web., 331.

Lockwood v. Faber, 27 Fed., 63.

Patent Act of March 3, 1897.

In considering the question of abandonment attention should be paid to the effect of the amendment of March 3, 1897, to sections 4886 and 4920 of the Revised Statutes.

Previous to this amendatory act two years public use prior to the application for patent constituted a bar; but a publication or prior patent was not a bar unless prior to the date of the patentee's invention. Thus, assuming Edison's invention of the patent in suit to have been made in 1888, proof of that fact would, under the old law, prevent consideration of the patents of Lioret and Young, as well as the 1892 Edison patent (split-mold) as anticipations.

But, by the act of 1897, a patent or printed publication in this or any foreign country is effective as an anticipation of a patentee's invention if "prior to his supposed invention or discovery thereof, or *more than two years prior to his application for a patent therefor.*"

The foregoing patents therefore, are just as effective as if they bore a date prior to 1888.

This act gives a further expression to the design of the law makers to compel diligence in making applications for patents, and in fixing two years as the maximum period of delay which will be tolerated.

Certainly a delay of *twelve* years, during which Edison himself as well as others took out patents relating to casting and molding sound-records, is conclusive evidence of abandonment in the absence of any justification for such delay.

The Relation of Patent No. 713,209 to This Suit.

It is important to notice the relation between the patent in suit, No. 667662, and No. 713209 (C. R., 334), particularly as defendant has also been sued upon the last named patent.

Patent No. 713209, though issued subsequently to the patent in suit, was applied for *two years and two months prior to the application for the patent in suit.* (The respective dates are March 5, 1898, and May 8, 1900.) The application for the patent in suit refers to the earlier application of March 5, 1898 (top of page 2), and, of course, *must be distinguished from it.*

The claims of No. 713209 upon which this defendant is sued are claims 2 and 3, which are substantially identical, just as claims 2, 4 and 5 of the patent in suit are substantially identical.

Comparing claim 2 of No. 713209 with claim 4 of the

patent in suit we find that they differ in no respect except that while claim 4 of the patent in suit specifies forming a record in the mold by introducing a molten material and allowing it to set (in other words by *casting*) claim 2 of patent No. 713209 specifies forming a hollow cylindrical plastic phonogram within the mold, without specifically stating how it is formed. This will appear more clearly from the following table:

Claim 4, Patent in suit.
The process of duplicating cylindrical phonograph records, which consists

(1) in forming a cylindrical mold with a record in negative on its bore,

(2) in introducing a molten material in the mold to form a cylindrical duplicate, in allowing the duplicate to set,

(3) in contracting the duplicate,

(4) and in removing the contracted duplicate by a direct longitudinal movement.

Claim 2, patent No. 713209.

The method of producing hollow cylindrical phonograms, which consists

(1) in obtaining a mold having a reverse phonogram-record on the inner wall of a cylindrical opening,

(2) forming a hollow cylindrical plastic phonogram within said mold,

(3) releasing the phonogram from the mold by a radial contraction of the phonogram sufficient to entirely clear the surfaces,

(4) and in withdrawing the contracted material from the mold by a direct longitudinal movement.

If the second step of claim 2 meant forming *by casting*, the claims would be identical. But patent No. 713209 describes no process of forming the sound-record except by expanding a blank within the mold (i. e., the "pressing" process). Hence the most favorable view for complainant of the situation of these two patents is that No. 713209 is for shrinking out a record which has been *pressed* in the mold, and No. 667662 is for shrinking out a record which has been *cast* in the mold.

Our proposition under this head is that after cooling a phonogram from the *plastic* state and thereby contracting it, it is not a distinct and separate invention to cool a phonogram from the *melted* state thereby contracting it.

Whether the record has been cast in the mold or pressed in the mold, its removal by contraction and longitudinal withdrawal is the same, and in neither case is the manner of removal of the record a part of the process of making it. Mr. Cameron testifies (D. R., p. 33) :

"I cannot regard the removal of the article from the mold as *any part of the process of making it*. After it has been cast and cooled, the manufacture of the article is obviously complete, and the manner of its removal from the mold is simply a matter of the construction of the mold—the ordinary operation of the laborer."

Here then is a case wherein Edison seeks to obtain—not one patent—but *two patents*, for an act which is not patentable at all. Ask him how his "pressing" process of No. 713209 differs from other pressing processes (Lioret and Young), and he replies, "not in the process of pressing the record, but in the way in which I take

the pressed record out of the mold." So the "casting" process of No. 667662 differs from other casting operations (the 1892 patent), not in the act of casting, but in the manner of withdrawal of the record from the mold; and the manner of withdrawal in the first case is the same as that in the second, namely, "shrinking it out."

Mr. Cameron's statement quoted above is confirmed by consideration of complainant's expert's attempt to reply to it. All the latter can say is:

"The removal of the article from the mold is as much a part of the method of making it as the diametric contraction of the article from the mold, and one step necessarily follows the other. When the article is diametrically contracted, as is necessary when a continuous mold is used, then it must be directly withdrawn."

This does not assert that the manner of removal of the article from the mold has anything whatever to do with the *making* of it. Manifestly, after the article has been cast it may remain in the mold indefinitely and is all the while a complete article. Or it may be taken out by a direct longitudinal motion, as specified by the Edison patent, or with a twisting motion, as in the Lioret patent. Certainly it is the *same record* made in the *same way*, whichever of these things be done.

If Mr. Cameron's view be sound, and the withdrawal of the record is not a part of the operation of making it, and cannot give patentable novelty to the claim (particularly after that mode of withdrawal has been claimed in connection with a pressed record) the claims are void because they specify nothing but introducing molten material into a mold, which is not new.

Aggregation.

The well settled rule regarding "aggregation of old elements" furnishes another ground for disposing of these claims. The doctrine, briefly stated, is that the elements of the claim must, in their action, qualify each other while contributing to the general result. Thus, to combine a lead pencil and a piece of india rubber in one article was not a patentable invention, because each old device produced simply its own old result. There was no new result due to any joint action. (*Reckendorfer v. Faber*, 92 U. S., 357).

In *Hailes v. Van Wormer* (20 Wall., 353) the Supreme Court said:

"Merely bringing old devices into juxtaposition and then allowing each to work out its own effect without the production of something novel is not invention."

It is, we submit, obvious that the act of forming a sound-record by casting (i. e., by introducing molten material into the mold and allowing it to harden), and the act of taking it out by a longitudinal motion (or in any other way) are isolated and wholly unrelated acts. The operation of casting remains the same, however the sound-record may be removed from the mold, or if it be never removed. The act of taking the article out of the mold is the same, whether it was made by casting, dipping, or pressing.

It would be quite as proper to add as steps of a process the operations of wrapping the record in raw cotton, and placing it "by a direct longitudinal motion" in a pasteboard carton. No patents describe doing these things with a cast record; and, on this principle, one

could take out still another patent which would dominate the whole art.

We submit that claims 1, 2, 4 and 5 cover mere aggregations, or unrelated acts, and are unpatentable for that reason.

Particularly we submit that, after describing and claiming the removal of a pressed record from a mold by contraction and longitudinal movement, there is no basis for claiming the same way of removing of a *cast* record from the mold.

Infringement.

If the claims are read without reference to any new steps invented by Edison they are void for the various reasons already presented. When read in connection with the specification, as for the process set forth therein, defendant's process does not infringe.

Defendant's process is, in fact, radically different from that of the patent because, in respect of the material step thereof, it proceeds in the opposite direction to that pointed out in the patent.

The gist of the Edison process, i. e., the means whereby the sound-record is impressed upon the tablet, consists in the use of a mold *so much colder than the melted wax as to "result in the almost instantaneous chilling of the surface of the molten material therein"* (p. 2, top 2d col.). It is even recommended that the mold be kept at a temperature lower than that of the atmosphere.

Therefore, the "introducing a molten material in the mold to receive a surface impression from such record," followed immediately by "allowing the molten material to set," as stated in the claims, means that the setting immediately follows the introducing of the material. It precludes the introduction, between these two steps, of

the radically different steps of *superheating both mold and contents*. This makes a different process since, to *operate as described in the Edison patent, the mold must always remain at a temperature materially lower than the melting point of the wax*.

Complainant's expert, Mr. Dyer, realizing that a claim which simply specifies pouring melted wax into a mold, allowing it to set and contract and then withdrawing it lengthwise of the mold (claims 2, 4, and 5) is too broad to be sustained, being merely the ancient process of casting, seeks to save the claims by importing into them certain limitations. For example, he limits the process to one in which a *continuous* mold is used, and one wherein the original record was made with a shallow curved edge recorder. Mr. Dyer says that it was

"only when the modern curved-edge recorder was invented that it *became possible* to use continuous molds and to shrink out the duplicates so that they could be longitudinally removed without injury to the record surface" (C. R., p. 194, 774).*

We have shown that the use of a continuous mold cannot be considered as an element of the claim because it is not a difference in process, but in apparatus. Nor can the making of the original record with a curved edge recorder be considered as a limiting feature of the claim, because (a) it is not mentioned even in the specifica-

*In his deposition in the companion suit No. 1103, Mr. Dyer states this proposition in even stronger terms. He says that shrinking out the record has been made "*commercially practicable*," by use of the curved edge recorder (p. 19); that it "*became possible only*" after the curved edge recorder came into use; that it would have been "*a mechanical impossibility* with the chisel like recorders" previously used (p. 33, fol. 132); that previously "the records were of such a character as to *prevent* their effective removal by shrinkage" (Id., fol. 131); that the process of shrinking out "*could not be practiced*" with records of this character, and more to the same effect.

tion, much less in the claim; (b) it is not a part of the process of duplicating; (c) it is not true that the use of a curved edge recorder rendered the shrinking out of the records a possibility. Records made with the recorders of the old art can be duplicated by casting and shrinking out just as readily as those made with a curved-edge recorder (D. R., p. 85, Qs. 28-31; Defendant's Exhibit Cast Record with Square-Cut Groove).

We concur with complainant's expert in thinking that, if the claims are to be sustained, it will only be by reading into them some new step or steps which distinguishes the procedure from that of the ancient method of casting, and which overcame some difficulty peculiar to the casting of sound-records. There were, *as every one agrees*, substantial difficulties peculiar to the casting of sound-records, and *no process of making sound-records would be practical without means for overcoming those difficulties*. Let us first see that the essential fact here stated is testified to by witness on both sides, and then show its decisive application to the question of infringement.

Macdonald's patent clearly set forth those difficulties, and *describes and claims a remedy*. The difficulties were the entrapping of air-bubbles, the lack of limpidity of the wax, and hence an impression lacking in sharpness, and the tendency to streaking, or forming what Macdonald calls "run downs." These things occur when the wax is simply melted and poured into the mold as in the ordinary process of casting (D. R., p. 60, Q. 59; p. 72, X-Q. 45).

In this testimony Mr. Macdonald is confirmed by that of complainant's witnesses.

Mr. Edison speaks in many places in his deposition of the difficulty arising from air-bubbles, and in answer

123 (p. 161), says that you cannot pour wax into the top of the mold because "this made a streak and air would get in. *You can't do it this way.*"

Aylesworth testifies (C. R., p. 125, Q. 67) that at certain temperatures, the molten wax must be introduced *from the bottom*, otherwise "there would be *longitudinal imperfections that would be very marked.*"

Mr. Dyer says (C. R., p. 179, Q. 6) that when the wax is poured *into the top of the mold* "there might be difficulty in preventing the formation of air-bubbles on the surface of the duplicate as well as other surface disturbances."

Again he says, in distinguishing the patent in suit from the operation of the 1892 "split-mold" patent (p. 183):

"the mold was presumably cold, and the molten material was poured in from the top. This would result in entrapping large quantities of air, which would destroy the operative character of the record surface, and would also result in the production of surface disturbances referred to by Mr. Macdonald as 'run-downs.' In my opinion it would be impossible to produce a duplicate suitable for reproduction by pouring a molten material into a cold mold from the top, unless possibly the temperature was extremely high, and in this respect Mr. Macdonald agrees with me."

(It would have been more accurate, as well as more modest, to have said "I agree with Mr. Macdonald.")

The witness continues:

"To make the casting process operative, the material at the instant that the impression is taken must be in a limpid non-aerated condition" (p. 184).

Again he says (p. 191) :

"in order to practice the invention of the patent in suit the introduction of the molten material in the mold *must be* effected in such a way that it shall be *limpid and non-aerated* when the impression is taken."

These statements unequivocally assert, what is an undoubted fact, that the process *must* include steps which secure these essential conditions. This "*must be*," otherwise the entrapping of air would "*destroy* the operative character of the record surface," and it would be "*impossible* to produce a duplicate suitable for reproduction."

Now we observe, in the first place, that Edison's patent is *absolutely silent* as to these essential conditions and as to any means for overcoming them. Macdonald describes them, describes a method of overcoming them *by superheating the mold and wax*, and claims this method as his invention.

Edison's silence is due to the fact that his process was entirely theoretical. It had never been used, and in order even to say that it would operate at all, it was necessary to construct an apparatus and to try it *after this suit had begun* (Aylesworth, C. R., p. 125, Q. 70). This test apparatus was made in the *spring of 1903*. The material used in this test was *complainant's secret composition* (p. 245, Q. 132).

Mr. Dyer testifies, however, that the essential conditions specified by him are secured *by introducing the molten material into the bottom of the mold*. Assuming that this method can be successfully practiced with a cold mold and without superheating, we have these conditions:

(1) Unless the wax is in a limpid and non-aerated condition at the time the impression is taken it is *impossible* to cast sound-records.

(2) The *only* method disclosed in the patent for securing these conditions is the method of "*elevating* a part of the mass of molten material into the mold" (claim 9).

It follows that this mode of "*elevating*" the material is an essential step of the process. It is essential to make it operative, and it is essential to distinguish it from the old casting operations. Therefore, the process of this patent is radically different from that of defendant. The process of *elevating* the material into a *cold* mold to produce an *instantaneous chilling*, cannot be confounded with a process of *pouring* into a *hot* mold and then *superheating* to avoid an instantaneous chilling.

The Edison patent cannot possibly be construed so as to cover a process in which the material is poured into a mold because that cannot be done with a *cold* mold, the only kind described in the Edison patent.

Edison, therefore, cannot appropriate Macdonald's process, because he did not invent it.

Mr. Dyer says (p. 189) that the patent in suit is "*unquestionably*" limited to the use of a continuous mold because a "continuous mold is the only type of mold that is described." For the same, and better reasons, the patent is limited to the *elevating* of the molten material into a cold mold; the better reason being that these features are steps of a process, whereas a continuous mold is not part of a process and is old.

Finally, the claims are limited to the making of a

mold by the vacuous deposit method. This follows of necessity from the statement in the specification that

"My invention relates to an improved process for duplicating phonograph records, and the process is *of the character covered by my patent No. 484582, of October 18, 1892.*"

We have shown (p. 8, *supra*) that the process "covered by" patent No. 484582 is *solely* a process of making molds by vacuous deposit. The process of the patent in suit is therefore of this character. Defendant's process is *not* of this character and there is hence no infringement.

It is no answer to this to say that the specification of the patent in suit also refers to pending application of March 5, 1898, for a detailed description of the method of making the mold, and that said application (now patent No. 713209) after fully describing the vacuous deposit plan suggested that a plumbago coating might be used. The specification of the patent in suit clearly shows that it was not to the latter suggestion that reference was made, for it says (p. 2, top of col. 1):

"by the process described in my application for letters patent No. 672650, *by first depositing upon the original record a suitable metal in the form of an infinitesimally thin film by a process of vacuous deposit,*" etc.

In view of this explicit statement, Mr. Dyer's attempt to make it appear that the reference to patent No. 713209 was intended to embrace the method of coating with plumbago, cannot succeed (C. R., pp. 164-167).

Claim 1 is not infringed for the further reason that, if limited, as Mr. Dyer says, to the production of a *definite product*, namely, a record having on its surface

100 spirals to the inch, there is no evidence that defendant ever produced such a product. The only testimony on this point is that of Pierman (C. R., p. 15), who testifies that the molded records made by defendant had "approximately 100" threads to the inch (Q. 14). Manifestly 101 threads would be approximately 100; but would not infringe.

Utility of Macdonald's Process.

After proving by Pierman that the process carried on by defendant "differs in no way" from that described in Macdonald's patent No. 682991 (C. R., p. 17, Q. 22), complainant introduced evidence tending to show inoperativeness or inutility of the process.

Edison (p. 152) gave it as his opinion that the Macdonald patent did not describe an operative process (Q. 76) and that the superheating the wax would rather increase than eliminate air-bubbles (Q. 78).

He admits, however (Q. 77), that he was speaking without knowledge, and that one of his assistants, Rosanoff, was trying some experiments, "to see what he can make out of it" (Q. 76).

Rosanoff does not confirm Mr. Edison's off-hand judgment—but just the reverse. In his alleged attempts to practice the Macdonald process he tried two series of experiments, series *a*, and series *b*.

Series *a* were tried with a material unheard of in the art, to wit, a mixture of *unsaponified* stearic acid and ceresin (C. R., p. 249, Q. 5). Series *b* were tried with some composition handed to him by the foreman of the wax department and said to be "ordinary record composition."

The reason why the witness used a mixture of "stearic

acid and ceresin" was because the Macdonald patent speaks of the composition at present employed as being "a mixture of stearic acid and ceresin" (C. R., p. 320, line 104).

But in these compositions the stearic acid has always been converted into soap by means of caustic alkali, in other words "saponified." The Macdonald patent says:

"I fill the mold with the melted material (*soap mixture* or the like), which is hereinafter, for convenience designated 'wax' " (p. 320, line 59 *et seq.*).

Anyone having the slightest acquaintance with the art knows that the stearic acid, used in these wax-like compositions, is saponified, or converted into soap, by means of an alkali such as caustic soda (D. R., p. 82, Q. 13). The composition used by defendant is described in Macdonald's patent No. 606725 (D. R., p. 274), which gives the precise formulas (p. 276; l. 25 *et seq.*), and which describes the saponification of stearic acid by means of caustic soda, and the addition of a small quantity of aluminum to take up moisture. The product thus obtained is mixed with "paraffin, ozocerite or ceresin" (l. 56). On the drawing are the descriptive words "stearic acid, caustic soda and aluminum."

Notwithstanding this, Rosanoff was instructed by Edison to try a series of experiments using stearic acid not saponified.* Of course, the experiments tried with this material were failures (p. 250).

The series *b* experiments were, on the contrary, successful even in Rosanoff's inexperienced hands. He says that this is "an excellent material irrespective of

*In order to carry this through Edison had to select a stranger to this art who was absolutely ignorant of what was used for making sound-records during the past fifteen years (Rosanoff, p. 256, X-Q. 7).

the process of molding" (p. 251, fol. 1001). All he would assert with respect to the Macdonald process applied to this material is that there was no advantage in applying to it the process of superheating and chilling.

Macdonald replies to, and disposes of Rosanoff's criticisms (D. R., p. 81, Q. 7 to p. 85, Q. 27). This requires no discussion in detail, for the merit of defendant's process is not in issue. It is good enough for the production of more than twenty thousand records *per diem*, whereas that of the patent in suit has yet to produce its first commercial product.

We confidently ask a decree dismissing the bill.

Respectfully,

PHILIP MAURO,
Counsel for Defendant.

Washington, May, 1904.

APPENDIX 1.**Mr. Dyer's Deposition.**

Although reference has been made at appropriate places to the more pertinent parts of Mr. Dyer's deposition, we think it calls for comment as a detached effort and in connection with Mr. Dyer's relations to the patent and to the patentee.

Mr. Dyer is thirty-three years old, and is wiser, and much more assured of his own wisdom, than he will be after added experience has produced its usual effect. Since 1897 he has had "exclusive and personal charge of all of Mr. Edison's patent applications," and in April, 1903, he located himself at the Edison laboratory, becoming thus closely identified with Mr. Edison's work (p. 163). This circumstance, which does not enhance Mr. Dyer's qualifications for giving expert evidence in one of Mr. Edison's cases, will account for some enthusiastic and rapturous expressions found in his deposition, and for his extremely partizan position throughout.

Mr. Dyer prosecuted this patent through the Patent Office and furnished the theories and "arguments" by which the examiner was induced to allow it. He, moreover, acted as counsel for complainant herein, attending and cross-examining defendant's witnesses. We are therefore compelled to regard him in the aspect of the personal counsel and zealous advocate of the complainant, rather than as the court's scientific and technical adviser touching the terms of art and principles of science involved in this case.

We take exception, therefore, at the outset to such statements as that "the patent in suit relates to an art which not only found its inception in Mr. Edison's

work, but was also commercially developed by him" (p. 164); and as that the patent in suit presents "the first disclosure of an operative process for producing duplicate phonograph records by a casting process, and it has gone very largely into practical use." In no proper sense can these statements be accepted as true; but if we regard them merely as the extravagances of the close personal friend, admirer and partizan, we will not be too greatly impressed thereby.

So too, when we read such a statement as this:

"When the extremely delicate and microscopic character of phonograph records is considered, the problem of duplicating them *must have seemed practically impossible, and I doubt if any one other than Mr. Edison would have had the audacity to attempt such a thing*"

we cannot pause to wonder at Mr. Edison's audacity, for which our admiration is solicited, being completely carried away by that of his over-zealous and indiscreet admirer.

Of course, Mr. Dyer's object and hope in these and like deliverances are to impress the court with the idea that, *in the patent before us*, we have the disclosure of an important and patentable invention. Of that the court will judge, from the evidence, and we make these general comments, not in the spirit of criticism, but simply to show that Mr. Dyer's opinions cannot be accepted as unbiased and impartial, when he speaks of the subject matter of this patent; as for instance when he refers to it as

"the *very ingenious suggestion* of forming the original record or master on a special recording machine having an abnormally coarse pitch"

(in other words, following the invariable custom of allowing for shrinkage); or when he speaks of the idea of allowing the record to cool and shrink as "an extremely ingenious invention" and says:

"I cannot emphasize too strongly *the brilliancy of Mr. Edison's achievement in this respect.*
* * * Personally I regard Mr. Edison's achievement in duplicating phonograph records as an invention of the highest order" (p. 194).

We would not deprive Mr. Edison of the enjoyment he must derive from such intense and thorough-going admiration. No wonder he likes to have near his person one capable of going into ecstatic raptures of praise upon so slight a provocation.

This last quoted extravagance applies (if to any one) to Mr. Macdonald first of all; he having been the first to give cast sound-records to the public, and having developed his process by adding to the known art of casting the steps which were needed in order to give useful results in this particular application of that ancient art. Mr. Macdonald has no advertising bureau or press agents; but when he goes after a result he gets it speedily, while, in a like endeavor, we see Mr. Edison and his retinue of experimentalists floundering for a decade in the wilderness.

It will not avail to refer, in aid of this patent, to the microscopical character of the minute cuts or gouges constituting the sound-record and to speak of copying them as presenting "a problem *which almost staggers the mind.*" Mr. Dyer could have steadied and calmed his mind by the reflection that all this had been known for many years. On the same day (May 4, 1886) that Bell & Tainter's patent was granted for the art of cutting or gouging a record in wax-like material, Tainter's

patent No. 341287 (D. R., 222), issued for a method and means of copying records.

Having seen this much of Mr. Dyer's relations with this patent and with the patentee, we are prepared understandingly to examine some of the more important parts of his deposition. We desire particularly to discuss the following points:

1. Mr. Dyer's catalogue of ten "*errors of fact*" which, he says Mr. Cameron has made (p. 172); and his attack upon the latter's conclusions

"because many statements are made by him for which *no basis exists in fact.*"

2. The very remarkable comparison made by Mr. Dyer between Mr. Edison's process and defendant's, wherein he finds identity in twelve steps or operations (p. 196).

3. The manner in which Mr. Dyer "argued" claim 1 through the Patent Office (p. 211).

I. Mr. Cameron's "Errors of Fact."

The review of this part of Mr. Dyer's deposition (pp. 172-190) will indicate, as its first result, that Mr. Dyer has a very imperfect idea of what an "error" is, and what a "fact" is. First we would notice that "error" No. 4 (p. 175), which Mr. Dyer imputes to Mr. Cameron, is a repetition of No. 2; and that No. 7 (p. 176) is a repetition of No. 1. This reduces the counts in the indictment against Mr. Cameron to 8.

Next we would notice that numbers 5, 6, 8, 9, and 10 do not refer to matters of *fact* at all, but to matters of opinion, such as the interpretation of claims, etc., regarding which there is (or may be) room for difference of opinion. Thus we have at most but three matters of fact, and of these we notice that of error No. 3 (Mr. Cameron's statement that the amount of shrinkage of

wax-like material is "usually about three per cent.") Mr. Dyer says (X-Q. 118, p. 240) "the point is unimportant." To dispose of this unimportant point we would say only a few words. Mr. Cameron's statement (D. R., p. 24) is

"The amount of shrinkage will depend upon the particular composition of waxes used, but usually it is about three per cent."

This is a correct approximate statement of the shrinkage in bulk, allowing one and one-half per cent. shrinkage each way (longitudinally and diametrically). In calculating the amount of clearance of a cast record, after it has cooled down, Mr. Cameron showed (p. 31) that, if it were one per cent. the contraction would be "about ten times as great as would be necessary to free the record groove," and if three per cent. that it would be thirty times as great. Mr. Cameron, in treating the three per cent. contraction as if it were all in a diametrical direction undoubtedly placed it higher than occurs in the ordinary compositions. But inasmuch as the clearance is many times greater than necessary to remove the record from the mold, this estimate is, as Mr. Dyer admits, unimportant.

Mr. Dyer himself, in suit No. 1103 (C. R., p. 20 therein), says that the longitudinal contraction is "between 1 per cent. and 3 per cent."

We will now consider the remaining "errors of fact" in order:

Error No. 1. Mr. Dyer choses (as he has a right to do) to regard the period during which the casting cools down to normal temperature, as being divided into two parts, the first part ending at the "setting" or congealing of the melted material, and the second part ending with the cooling of the cast. What Mr. Dyer seeks to emphasize is the fact that the diametric contraction oc-

curs after the material sets or congeals. This is true, but so obvious as hardly to call for elucidation. When the material congeals it must of necessity fill the mold diametrically, and the diametrical contraction of the record which permits its removal from the mold must occur thereafter.

Mr. Dyer charges Mr. Cameron with contradicting this very obvious fact. He says that "Mr. Cameron apparently does not understand what takes place when a molten wax-like material is introduced into a mold" (p. 172), and then proceeds to state the above obvious fact with all the air and manner of one expounding some abstruse principle of science or mystery of nature. But Mr. Dyer abstains from quoting any passages of Mr. Cameron's deposition to support this accusation. We will supply this omission. Mr. Cameron says (D. R., p. 25) :

"When the material in the mold has become thoroughly cooled by exposure to the cold atmosphere, it *solidifies and contracts away from the bore of the mold,*" etc.

And on page 29—

"When this molten wax is poured into a cold mold it is instantaneously chilled and changes from a liquid to a solid condition, i. e., it 'sets,' and *upon further cooling it contracts.*"

Mr. Cameron thus explicitly says that the contraction occurs after the congealing of the mass.

Edison's own prior patents, quoted by Mr. Cameron on page 23 refer to

"the excessive contraction of the wax *in cooling*" and to

"a material which *in solidifying* shrinks or contracts greatly, such as certain waxes, and preferably carnauba wax."

Mr. Dyer might, upon these statements impute ignorance and mistake to his client, but no basis exists for criticising Mr. Cameron's statement of what occurs when the wax cools. So wedded is Mr. Dyer to the idea that Mr. Cameron supposed that the diametrical contraction occurs before and not after the setting of the liquid material, that he sees this notion everywhere. Thus (p. 203, fol. 812) he quotes a passage from Mr. Cameron's deposition, and says "He is entirely wrong when he assumes that the setting of the material is accompanied by a diametric contraction." No such assumption appears in the passage quoted, nor does it contain anything which could be tortured into such a meaning.

Again, on the next page (fol. 814) he quotes another passage in which Mr. Cameron makes the obviously correct statement that the duplicate is complete (so far as any patentable process is concerned) "when it has reached *its fully contracted condition*." Once more Mr. Dyer says "He assumes that when the material is set it has necessarily contracted," and makes another slurring remark as to Mr. Cameron's "ignorance of the practical conditions," accompanying it with the owl-like repetition of the statement "I have shown the error of this position."

Again, in X-Q. 92, p. 233, defendant's counsel referred to the shrinkage which occurs "upon cooling from a melted condition;" and thereupon our expert takes occasion to repeat his previous gratuitous statements with this preface, addressed to counsel:

"I call your attention, however, to the fact that you apparently have the same mistaken idea that Mr. Cameron has, namely, that the material shrinks

in cooling from a melted condition. It does not begin to shrink, at least diametrically, until long after it has set," etc.

This "mistaken idea," is not disclosed in the question. All this assumption of superior knowledge is of little importance and we would not call attention thereto, but that it is made the basis for imputing "ignorance" to defendant's expert.

As a matter of fact, the whole question is of no consequence in this case. The only "step" or operation involved is that of "cooling." The "setting" and "contraction," are merely *results of the cooling*. Therefore, it would be entirely accurate to regard the contraction as being (as it is in fact) the result of cooling considered as a single continuous operation. Mr. Dyer's own admissions make this clear (p. 238).

"105 X- Q. Is the setting of the material *the result of the cooling thereof?*

"A. Yes.

"106 X-Q. Is the contraction of the material *the result of cooling?*

"A. Yes."

"Error" No. 2. The wax-like compositions used for making sound-records belong to the class of "insoluble soda soaps," sometimes called "metallic soaps." As every one knows, the principal ingredient of these soaps is a fatty acid (such as stearic acid), which is saponified by means of caustic soda lye. (See Macdonald patent No. 606725, D. R., 275).

Mr. Cameron says that the "metallic soap" referred to in the patent in suit as one of the "wax like" materials used in the art for record tablets—

"is mostly composed of a fatty acid such as stearic acid."

This is absolutely correct; nevertheless, although stearic acid when used for this purpose is invariably saponified, and although the very word "soap" means a saponified fatty acid, Mr. Dyer takes Mr. Cameron's statement as an assertion that, in making the "metallic soap" used in this art, the stearic acid was not saponified. By attributing this meaning to Mr. Cameron he makes out his second and fourth "errors of fact."

Comment upon this performance is hardly required; but we ask the court to note one or two things in this connection. No *well informed* person could have misunderstood Mr. Cameron's meaning; and so, when asked (p. 238, X-Q. 107), whether it was not a fact that stearic acid is (and for fifteen years past has been) the largest ingredient going into the making of sound-record cylinders, Mr. Dyer shields himself behind the answer—

"I am *not very well informed* as to the exact manufacture of sound-record cylinders."

The succeeding cross-questions and answers dispose effectually of this alleged error of fact, and bring Mr. Dyer into an extraordinary position in the attempt to defend his most unjustifiable criticism. We ask particular attention to this.

In the direct, in order to show what a grievous mistake Mr. Cameron had made in asserting that "metallic soap" is "mostly composed of a fatty acid, such as stearic acid," Mr. Dyer said:

"This is not correct, as stearic acid is *entirely unsuited* for practical use as a record material owing to its *relative softness*, and to the fact that when in a molten condition it vigorously attacks the surface of the mold to destroy the latter."

Of course, this only goes to show more clearly that Mr. Cameron, when he spoke of metallic soap being composed mostly of stearic acid, could *not* have meant the impossible thing—namely a soap *not* saponified—but meant stearic acid used as it always has been, and must be, used in soap making.

So, in cross-examination, when it was no longer a matter of exhibiting Mr. Cameron's ignorance and grievous mistake, but of trying to find some justification for imputing that mistake to him, Mr. Dyer makes this statement (p. 239, X-Q. 112):

"Stearic acid is a *relatively hard* wax-like material with a smooth surface, and would have *some utility as a material from which records* could be made, so that if a person should refer to stearic acid I might get the impression that such was the material he had selected."

Now here we have certain statements from Mr. Dyer regarding matters which are strictly "matters of fact." One statement is that stearic acid is "*entirely unsuited*" for practical use as a record-making material owing (*inter alia*) to its "*relative softness*;" the other statement is that stearic acid has "*some utility as a material from which records could be made*" because (*inter alia*) it is "*a relatively hard wax-like material*."

Edison's patent No. 713209, mentions among the materials he may use (p. 3, l. 10) "stearic acid."

Whether Mr. Dyer in direct examination is in error, or Mr. Dyer in cross-examination, is of no consequence. In either case he is disqualified to judge "errors of fact."

Error No. 3. The matter of approximate shrinkage of wax-like materials has already been disposed of.

Error No. 4. This is a repetition of No. 1, and has been disposed of.

Error No. 5. Mr. Cameron, in construing claim 1, and attempting to find a meaning for the words "maintained in an abnormally high temperature," pointed out that this expression was not in the specification at all, and that the latter only spoke of the material being *melted*, and indicated *nothing higher than the melting point of the material*. The object was to explain that these words did not mean (as might be supposed) superheating the material as in the Macdonald process. Mr. Cameron gave the following clear and accurate explanation (D. R., p. 27) :

He quotes a passage from an argument filed by Edison's attorneys, stating that the word "abnormally" means maintaining the material "above atmospheric temperature" and says:

"From this it is clear that the patentee regarded atmospheric temperature as the *normal* temperature of the wax-like material, and anything 'above the atmospheric temperature' as 'abnormally high temperature,' and the expression 'maintained in an abnormally high temperature' merely means *kept above the atmospheric temperature* till it is introduced into the mold, and wax that is simply melted therefore responds to the expression 'maintained in an abnormally high temperature' as used in claim 1."

Mr. Dyer objects that the statement "abnormally high temperature" does not necessarily mean *as high as the melting point* (no one had said it did), but that a lower temperature would respond to the claim, and specifically that the claim would be satisfied by the "pressing" process of Edison's patent No. 713209. We fully agree

to this; and there is no "error of fact" anywhere, and not even a difference of opinion. This is but another item tending to show that there was no invention in allowing for shrinkage of the record, since, as Mr. Dyer here admits, Edison *had an opportunity to describe and claim this expedient in an application filed two years earlier than the application for this patent, and did not do so.*

But while Mr. Cameron does not differ in this respect from Mr. Dyer, Mr. Edison most emphatically does. When asked what he meant in claim 1 by "abnormally high temperature" (p. 155 X-Q. 96) he said:

"So that the material was at a temperature *where it was perfectly limpid.*"

If there be any "error of fact" in regard to the meaning of these words, the court will now have no difficulty in locating it.

Error No. 6. Mr. Cameron construes claim 1 as meaning what it says, namely, "making an original record with a spiral record groove of greater pitch *than that desired* on the duplicate to be produced." Mr. Dyer, to avoid some of the obvious difficulties about this claim, construes it to mean making an original record with a spiral of greater pitch than 100 to the inch, and just enough greater to shrink down to 100 to the inch. Now, whatever this claim may mean, the interpretation given by Mr. Cameron is certainly not an "error of fact."

In answer to X-Q. 124 (p. 242) Mr. Dyer asserts his confidence in his own view and wrestles with the difficulties involved therein. For example, Mr. Dyer sees a difference between making the pitch of the master *greater* than that desired on the duplicate, and desiring the pitch of the latter to be *less* than that on

the master; but this and answers 125, 126 tend to show that Mr. Cameron's view has the better reason. He shows that the carrying out of the claim does lie in the operators "desire," and not in his acts.

Error No. 7. As admitted by Mr. Dyer (p. 243, X-Q. 217), this is a mere repetition of alleged error No. 1.

Error No. 8. Mr. Dyer admits (p. 244, X-Q. 128) as is quite obvious, that we have here, not a *matter of fact*, but a question of interpretation of the claims. Since the claims contain no reference to a *continuous* mold, and since continuous molds were old, and since the construction of the mold cannot be a part of the *process* wherein it is used, Mr. Cameron does not regard the claims as limited to a continuous mold. Every step of the process might obviously be practiced in a sectional mold.

Mr. Dyer desires that the claims be regarded as limited to the use of a continuous mold. Even if his reasons therefor were sound and sufficient, it could not be said that one maintaining the contrary view was chargeable with an "error of fact." We maintain that Mr. Cameron's view is correct.

Error No. 9. Mr. Cameron says that he cannot regard the act of *removing the record from the mold*, as a part of *the process of making it*. He says:

"After it had been cast and cooled the manufacture of the article is *obviously complete*; and the manner of its removal from the mold is *simply a matter of the construction of the mold*—the ordinary operation of the laborer."

As complainant's own witness (Pierman) says (p. 25, X-Q. 101-103), when the mold is continuous there is no other way of taking out the molded object except by

withdrawing it longitudinally, and this has been done in the talking machine art for about ten years *to his knowledge*.

Mr. Dyer, however, is constrained to say (p. 177) concerning the above passage in Mr. Cameron's deposition "I cannot subscribe to this view;" and he gives, what seems to us a very feeble and inadequate reason for contending that the act of taking the cast article out of the mold, is a part of the process of making the article. His reason would equally well establish that wrapping it in cotton batting and placing it in a carton, are likewise steps in the process of making it.

But, in any view of the matter, Mr. Dyer's professed inability to "subscribe to this view," does not warrant his calling it an "error of fact."

Error No. 10. Mr. Cameron pointed out that the patent in suit expressly declares that it relates to an improved process of the character *covered by* patent No. 484582, of October 28, 1892; and that the process "covered by" that patent was solely and only one of forming a mold by vacuous deposit as the first step, and then proceeding to complete the mold and cast a sound-record therein. Mr. Dyer admits the correctness of these premises (p. 228, X-Q. 80-82).

Now Mr. Cameron deduces from this, that the invention of the patent before as a process "of the character covered by" said earlier patent, to wit, one wherein the vacuous deposit of a metallic coating is the first step. We think that no other deduction is possible. Mr. Dyer not only thinks differently, but thereupon charges Mr. Cameron with another error of fact. To support the contrary view, Mr. Dyer points out that the specification refers for "*specific instructions* as to how to make the mold," to Edison's patent No. 713209, which de-

scribes the vacuous deposit method, and also speaks of the possibility of using a coating of plumbago. Manifestly this does not in any respect modify the statement that the invention is a process of the character "covered by" the earlier patent. There is no ambiguity about this statement.

There is clearly a much better reason for limiting these claims to a process wherein the depositing of a metallic film *in vacuo* is a step, than for limiting them to a continuous mold, or to one having round cut record grooves, which are matters of *construction of the mold*, and not parts of a process.

Mr. Dyer's conclusion from these "errors of fact" which he attributed to Mr. Cameron, is that they have

"led him to take a mistaken view of the relation between the invention of the patent in suit and the prior art."

This conclusion, of course, fails. We reach, on the contrary, the conclusion that Mr. Cameron's view of that relation is correct in every particular.

II. Mr. Dyer's Comparison of Defendant's Process With that of the Patent in Suit.

In answer to Q. 14 (p. 195) Mr. Dyer seeks to overthrow Mr. Cameron's conclusion that defendant's process differs materially from that of the patent in suit. Mr. Dyer's method of attempting to establish patentable identity is not commendable. He undertakes to make "the similarity between the two processes" understood "by a comparison of the *corresponding steps performed by each*." We invite attention to this comparison.

But first it must be said that the recited *steps* of the claims in suit are simply (1) pouring melted wax into a cold mold, and (2) allowing the material to cool

therein, after which it is (3) taken out of the mold; and we insist that this last act is not a "step" in the process at all.

Now in this alleged comparison, we have *twelve* "corresponding steps performed by each." Of these, numbers 2, 3, 4, 5, 6, 7, 8 and 12 (eight steps in all) are *admittedly old, and are not parts of the process of the patent in suit*. These "corresponding steps" are (2) covering the master record with a thin conducting coating; (3) then electrotyping with copper; (4) fitting the mold into a jacket; (5) removing the original record from the mold; (6) coating the mold with a non-oxidizable metal to resist rust; (7) introducing melted wax into the mold; (12) reaming the duplicate and trimming its ends after it is taken out of the mold. Step No. 1 is making the master-record on a recording machine having a coarse-thread feed-screw—not a process step at all. No. 8, allowing material to set; No. 9, the contraction of the material diametrically; No. 10, its contraction longitudinally, and No. 11, the withdrawal from the mold, are likewise old, as we have clearly shown. Mr. Dyer does not admit that these "steps" are old, but as to this we differ.

This attempt to force an appearance of resemblance to a *patented process*, by going *outside the patent and into the old art for all the steps, and into the admittedly old art*, for three-fourths of the alleged "corresponding steps," is a decided novelty in "expert" resourcefulness. The conclusion that—

"It would be difficult in fact, to conceive of two processes more closely connected,"

is another instance of that audacity which Mr. Dyer admires in, and possibly has copied from, his client.

Finally, we only ask the court to note how, while go-

ing outside the patents of Edison and Macdonald for his resemblances, Mr. Dyer carefully dodges the differences *fully set forth in the patents*, and which radically differentiate the two inventions; namely, using a vacuous deposit in one, and a plumago coating in the other; using a cold mold in one, a heated mold in the other; chilling the material by contact with a cold mold in one, superheating the material and mold in the other; introducing the material from beneath in one, and from above in the other; and removing the article and core in one, and the core first in the other.

Because the things invoked as *resemblances* are old, and are outside the patents, and in many instances relate either to the mold or to something else which is not the process of casting a record, the things actually described in the patents and which constitute the qualities or new features of each, differentiate them radically. Therefore, the very extremes to which Mr. Dyer has resorted, serve to bring into greater prominence the fact that Mr. Macdonald has made an independent improvement upon *the old art*, and that what he employs in common with the Edison patent, is *what he obtained from the old art and not from Mr. Edison*.

III. How Claim I was Argued Through the Patent Office.

It is not conceivable that this claim could have been granted had it been understood and the prior art fully presented. As it was, the primary examiner finally rejected the claim for the reason that—

“There is no invention in making the original record with a spiral groove of greater pitch than that desired on the duplicate as stated in claim 1, this being a necessity that has been recognized for many years in the art of molding” (D. R., p. 136).

In the *ex parte* appeal to the Examiners-in-Chief, the theories and statements of fact of complainant's solicitor (Mr. F. L. Dyer, the expert for complainant herein) were presented, but there was no one to point out even such well known practice in the art of molding as that of measuring patterns by a shrinkage-rule.

In his deposition herein (p. 211) Mr. Dyer quotes from his brief on that appeal. In that brief he made certain statements of alleged facts from which it was argued that it required the exercise of the inventive faculty to allow for the shrinkage of the record. It will be profitable to scrutinize and comment upon these statements.

First, Mr. Dyer draws a picture of the difficulties presented "when the first duplicates were made." Since these events occurred in 1888, long before Mr. Dyer had any personal knowledge of the subject, he could only have made these statements upon hearsay. He relates how the reproducer would slip from one groove to the next, and says that this often occurred three or four times in the reproduction of a single record. This would doubtless be the case, but the occurrence could not surprise any one who knew the shrinkage of the material he was dealing with. But now comes the effort to show that it required "invention," i. e., *the creation of some new means*, to compensate for this shrinkage. Mr. Dyer says that it was a matter of great difficulty to determine the *cause* of the lack of adjustment between the reproducer and the record. He refers to the microscopical dimensions of the record groove (invoked in another place to "stagger the mind"), stating that it required "patent investigation" to discover *the difference of pitch*.

We pause here to state that, if the skipping of the

reproducer did not instantly disclose to Edison and his skilled assistants that there was a difference of pitch, and if they required "patent investigation" and elaborate microscopical apparatus to make that discovery, they would present an exhibition of unusual stupidity and incapacity. But nothing of the sort appears. We have as witnesses in this case Edison, Aylesworth and Wangeman, who were present during these 1888 experiments, and not one of them hints that there was the slightest difficulty in assigning the skipping of the reproducer to its proper cause, namely, a difference in pitch inevitably brought about by the shrinkage of the cast record (Edison, p. 140, Q. 19, Wangemann, X-Q. 90; Miller p. 85, Q. 37, and p. 96, X-Q. 104). Miller says that he himself had made molded duplicates of original records of standard pitch, and observed that a standard reproducer would rarely track entirely across the cylinder without adjustment. This he says "could be detected by anyone" (C. R., p. 97, X-Qs. 113, 114).

But suppose the cause had been hard to locate! The discovery of a *difficulty* is not a patentable invention, but only brings one to the point of ascertaining whether *a remedy already exists, or whether it is necessary to invent something new*. Here the case for claim 1 utterly breaks down. No one can deny that the common practice of measuring the pattern from which the mold is made (i. e., the original or master record) by the proper shrinkage-rule met the difficulty completely. Nobody can or does say that it did, or possibly could, require any invention whatever to do this. Nothing new was needed and nothing new was proposed. To be sure, Edison and his assistants did not apparently know of a shrinkage-rule. Not being experts in the art of molding there was

much for them to learn. But the question is, not what was new *to them*, but what was new to mankind.

Mr. Dyer in his statement to the Board, after elaborating the alleged difficulties, patent investigation, and all that, intimates that he has told but a small fraction of the facts regarding the travail attending the birth of this "invention," for he says:

"To make a *long* story short, and to dispense with the telling of the *development* of the matter under consideration, it is enough to say that the difficulty was solved by Mr. Edison," etc.

In this case we have the persons who know (if they have not forgotten) the facts of sixteen years ago regarding the suggestion of allowance for shrinkage. Edison says (p. 140, Q. 19) simply that—

"we found that our reproducers required a great deal of adjustment, not always, but in most cases, *and we came to the conclusion it was due to the change in the number of threads.*"

No pretense is made here, or anywhere else in the testimony, that there was the least difficulty in arriving at this conclusion.

In this same answer Edison says that he had Schultze-Berge make experiments "to determine if it was something he couldn't take care of;" and from the latter's note book as well as from Mr. Edison's answer, it appears that these experiments were with "different materials having different degrees of contraction," and to determine how *much* shrinkage to allow for with the different materials. Schultze-Berge's note book is full of such calculations.

As to the suggestion of a remedy, Mr. Edison says simply (p. 141)—

“it occurred to me that if we once knew what the contraction was, that we might take the original master on a machine whose threads had a greater pitch, and when it reached normal temperature it would have the same pitch as the standard screw of 100 threads.”

The court must bear in mind that counsel and expert were aware of the desperate need of some *facts* from which invention might be argued, in doing what was obvious to every molder. That this had been impressed upon Edison in advance of his testimony cannot be doubted; and we see the painful and utterly vain efforts of counsel in Qs. 42, 43, 65, 66, 67, 68, 69, 70 to drag out of this interested witness something confirmatory of the notion that there were mysteries involved in this matter of shrinkage, that a microscope was needed to discover the fact of shrinkage and to discover that the way to compensate for shrinkage was to make the usual and proper allowance for it, etc.

But what Edison really shows by his testimony is that, though ignorant of the common practice in the molding art of laying out patterns by a “shrinkage rule” nevertheless, the proper allowance for shrinkage was to him an *obvious* means to the desired result.

No fact in the case contradicts this. Every pertinent fact confirms it. The allowance for shrinkage occurred to Macdonald, and he never thought or pretended that he had invented it. The same expedient occurred to Edison, and *he* did not think or pretend he had made an invention. This is *conclusively shown* by the fact that this idea “occurred” to him in 1888 (p. 141, Q. 19). He did not then seek to patent this idea, though patenting

every idea of the most trivial sort which could possibly be the subject of a patent. Four years later he renewed an application for patent *for this very subject of casting sound-records* (patent No. 484582), yet made no disclosure of this obvious expedient. Again ten years later (1898) he made an application (patent No. 713209) for molding sound-records, and did not deem it necessary even to refer to the obvious necessity for making proper allowance for shrinkage.

These events prove conclusively, not only that no invention was needed to allow for contraction of the spirals of the record-groove, *but that Edison knew it*. It is too late, twelve years after the expedient occurred to Mr. Edison, and after it is actually in practical use by another manufacture, to attempt to palm it off as an "invention" of his. We have treated elsewhere the article which arises out of these facts, and are here citing them only to confirm the proposition that no invention is involved in laying out the dimensions of the pattern by a shrinkage rule.

We can easily infer what the Appeal Board of the Patent Office would have done had they had before them the actual facts, as presented by this record.

APPENDIX II.

Thomas A. Edison, as a Patentee and Litigant.

The popular estimate of a prominent man is rarely correct. Generally it does him injustice in some particulars, and in others gives him credit which is not his due. We have before us a most conspicuous example of this, and it would be an interesting study to point out the errors in the popular estimate of Mr. Edison, and the causes therefor. This, however, we are not called upon to do, except so far as it has been sought,

in this case, to aid the patent (as it were) by a general appeal to Mr. Edison's fame as an inventor.

The patentee is entitled to the ordinary presumption arising from the grant of the patent; but, from the fact that the patentee is Mr. Edison, there arises no *special* presumption to the effect that the subject-matter involved the exercise of the inventive faculty. Nothing presented by the evidence in this case, or by the available records, warrants any such presumption. A few observations in support of this proposition are proper.

The evidence in this case, and the court decisions and current records in other cases, reveal Mr. Edison's methods of getting results. They are *not* the methods of the *inventor*, but those of the investigator. The evidence shows us the elaborate machinery for investigation which is established at the Edison laboratory. It is a veritable "invention-factory."

In it is employed a large corps of experimenters and searchers, and when a substance having peculiar properties is desired, the method employed is to set competent men upon the laborious task of making systematic search for it by examining in detail specimens of all different classes of substances where the thing desired might be found. This is a very different system from that of "inventing," which is the exercise of an inventive faculty or of a exceptional sense with which the ordinary mortal is not endowed. As an illustration we might compare two methods of locating a subterranean spring, one by the use of the divining rod, the other by employing a gang of laborers and digging in likely places until found. Or the difference may be illustrated by comparing the search on the seashore for a lost jewel by the occult power of clairvoyance, with that of rigging

up screening apparatus on a large scale and sifting the entire beach.

The popular conception of Mr. Edison is that of a man who accomplishes startling results by instantaneous flashes of intellect. The real Edison is the man of indefatigable industry, who attains his ends by patient effort intelligently applied.

The genius which consists in an infinite capacity for taking pains, in the faculty of organizing forces adequate to grapple with the problems presented, and in the employment of competent agents, is the kind of genius which Mr. Edison possesses in a very high degree, and for which he gets little or no public credit.

It is interesting to glance through such patents of Edison as have been of sufficient importance to come before the courts, and to note the general characteristics of the inventions covered thereby. In not one case will we find the brilliant thought characteristic of the product of the *inventive* mind; but in *every case* the results of careful search and judicious selection in the form of a particular kind of material which can be advantageously used to embody the *inventive* thought of some one else.

When Bell's brilliant invention of the electric speaking telephone startled the world, Edison immediately set his investigating machinery to work for the selection of the best material for the variable pressure contact points, which search resulted in the selection of hard gas carbon.

When Bell and Tainter brought forth the engraving method of recording sounds, Edison turned his machinery upon the selection of the best wax-like materials for the record (choosing insoluble soaps), of the best substance for the recording and reproducing points (chos-

ing sapphire) and for the diaphragms (chosing glass) and so on.

In the art of electric lighting, the same energies applied in the same way, yielded carbonized bamboo fiber for making filaments, and other useful details for the construction of incandescent lights.

When Roentgen announced the discovery of his X-ray, Edison worked night and day to ascertain what were the best fluorescent materials, and it was stated in the current public prints that, in an incredibly short space of time, he (including of course his corps of trained assistants) had examined the fluorescent properties of many thousand substances.

This kind of work is very useful and productive, and is worthy of all commendation; *but it does not lay the foundation for broad claims*, and consequently we find from the history of the litigation of Edison's patents that his solicitors are continually securing and advancing on his behalf claims which cannot be sustained, *and which have for their object, not to promote the art, but to stifle or retard it by suppressing the inventions of others.*

No case in the books, however, presents such a glaring instance of this as the case now before us, in which we are confronted by claims based upon *no new means or instrumentalities whatever*, but which nevertheless, if sustained, would absolutely monopolize any and every means of making sound records by the ancient method of casting.

We see in the first decided case involving an Edison patent some characteristics which strikingly resemble those of the present case, but were not presented in a form so gross. We refer to *Edison v. Klaber* (38 F.,

744), involving patent No. 180857 for a stencil sheet, or as it was entitled a *process* of printing by transfer.

The art of printing by stencil sheets was old at that date, but Edison, having invented a practical instrument ("electric pen") for making stencils sought to monopolize further advances in the art, by claiming a process.

The following quotations from Judge Coxe's opinion will sufficiently indicate the facts:

"There was room for the invention of a practical instrument, ~~but the discovery of this instrument does not enable the inventor to levy tribute upon the entire art.~~"

"He now seeks to prevent others who also invent new stencils from using the same old methods."

This is just what he is trying to do in the present case.

"There was nothing new in the method of printing, considered apart from the ingeniously formed stencil."

So here there is nothing new in the method of casting considered apart from the ingeniously formed (vacuous deposit) mold.

In that case there was an attempt to support and construe a claim in such manner as that infringement would depend upon *the use to which the apparatus was put*. In the present case, there is the more reprehensible attempt to construe claim 1 in such manner that infringement would depend upon the use to which the *product* of the apparatus was put (i. e., there would be infringement if a machine existed to fit the product, and not otherwise). The court said that the construction contended for would make the apparatus an infringing or non-infringing one, "*according to the use to which it was put.*"

Again, the claim would be infringed if the stencil had characters in script, and not infringed if the characters were Roman letters. Just as we have here a *process* which would be infringed if the inner surface of the mold had lines 1-1000th of an inch apart, and not infringed if these lines were 1-1001th of an inch apart.

Finally, the court found that the defendant was operating under a patent showing a distinct step in the art.

The Supreme Court affirmed this decision (149 U. S., 772).

Edison Co. v. Bernard Co. (88 F., 267). *Patent No. 264668 for a Dynamo Electric Machine.*

The court found the characteristic Edisonian attempt to monopolize the art by a "far-reaching all absorbing claim." The patent was held to be void and the bill dismissed.

Westinghouse v. Edison Electric Light Co. (63 F., 588).

In this case the Circuit Court of Appeals (Third Circuit) adjudged Edison patent No. 264642 to be void for lack of invention. In the case at bar the absurd pretense is put forward that the casting of sound-records was awaiting the "brilliant discovery" that the record, after cooling, could be taken out of the mold. A similar pretense was put forward in the case last cited, but was detected by the court, and the attempt to sustain a void patent upon this false pretense was prevented. The court said:

"It is true that prior to the year 1880 electric lighting for domestic purposes was not an accomplished fact. But this was not for the lack of anything shown by the patent in suit."

In the present case complainant was waiting for the peculiar material invented by Aylesworth, which came

into existence long after defendant was practically using its own molding system.

In *Edison v. Hardie* (68 F., 487), patent No. 224665 was sustained. This was for detailed improvement upon the patent which had been set aside in *Edison v. Klaber*.

Edison E. L. Co. v. U. S. Co. (47 F., 454), patent No. 223898. This patent is the basis for the popular notion that Edison invented the electric light. The decision shows that, after the incandescence of a high resistance medium *in vacuo* was known, Edison turned his energies upon the search for materials which would yield the best results, and brought forth carbonized bamboo fiber. The court found great difficulties in sustaining the patent, on account of the "shadowy demarkation of the line between the essential and the non-essential features of the invention."

Here was undoubtedly an improvement, and one of great utility; but it is one which presents the characteristics above pointed out, namely, the result of patient investigation, rather than of brilliant invention.

On appeal the second claim of this patent was sustained (52 F., 300). Its validity turned on the precise meaning to be given to the word "filament." The claim was as follows:

"The combination of carbon filaments with a receiver made entirely of glass, and conductors passing through the glass, and from which receiver the air is exhausted."

Obviously this was not a broad invention, and it involved merely a substitution of material, but it produced an important result and was therefore sustained.

The Edison electric light and other patents were not very effectually tried out, because the formation of the General Electric Company gathered into one combina-

tion all the powerful interests, and into one pool all the important patents. (See decision of C. C. A., 53 F., 592).

In 114 F., 926, we have the decision of the Circuit Court of Appeals (Wallace, Lacombe and Townsend, J. J. upon Edison's claim (popularly conceded) to be the inventor of the moving picture apparatus.

The patent was declared void as to claims 1, 2, and 3 because they attempted *to cover the use of all cameras taking pictures of this sort*, and claim 5 because of lack of invention. The court found that in the specification:

"The general statements imply that Mr. Edison was *the creator of the art*,"

and that the claims were framed with *merely functional limitations calculated to embrace all apparatus which performed the same functions*.

This is what we find in the case at bar. Mr. Edison's attorney (appearing in the role of an expert witness) puts forth the suggestion that Mr. Edison is the creator of the art of recording and reproducing sounds, and claims are framed (with not even so much as "functional" limitations) which are calculated to embrace the production of sound-records by any process, or apparatus wherein casting is employed.

We see in all these cases the system of putting forward on Edison's behalf the most extravagant claims; but it was left for the expert in the case at bar, to throw the efforts of all his predecessors into the shade, by claiming for his employer the "brilliant discovery" that a sound record which is made of material which shrinks on cooling, could be taken out of the mold in which it is cast.

Of chief interest to us is the history of Edison's patents and work in the graphophonic art.

Edison's original tinfoil phonograph patent of 1877 was never litigated. It was stillborn—the idea of making sound-records by indenting tinfoil or other pliable material being utterly impracticable (see Judge Shipman's opinion in 87 F., 873).

Since the Bell and Tainter invention (patent No. 341214) created the living art of engraving sound-records in wax-like material, Edison and his assistants have done much work and contributed many details going to the improvement in that art in respect of the recording material, of the shape of recording and reproducing points and the like. *All of his inventions in this art are of this narrow character.*

On December 7, 1896, by an agreement (D. R., 193), complainant and defendant exchanged licenses, the former receiving a license under the fundamental Bell and Tainter patents and the latter receiving licenses under a number of Edison patents.

The only attempt that has been made to enforce any of these Edison patents has been in *National Phonograph Co. v. Lambert*, wherein the decision of the Court of Appeals (Seventh Circuit) is found in 125 F. R., p. 922. Suit had been brought upon three patents, No. 382418, No. 382462, and No. 414761. The bill as to No. 382462 was dismissed in the lower court and no appeal taken.

From the Court of Appeals decision it is seen that patent No. 382418 was for a cylinder having a base tapering throughout its length; and No. 414761 was for forming ribs or projections on the inside of the cylinder. A single glance reveals that these are improvements of a very trifling sort, and although the court allowed to

them the attribute of patentable novelty, they construed the claims narrowly and dismissed all the bills on the ground of non-infringement.

We must therefore conclude that there is nothing in this case, nor in available records, which warrants, in respect of patents taken out by Mr. Edison, anything beyond the usual presumption. On the contrary, we find it to be the general rule that his inventions are of trivial character, and that he has been repeatedly rebuked by the courts for attempting, by means of such patents, to suppress improvements of others and to reap the fruits of their efforts.

The case now before the court is, we repeat, a glaring instance of this. Defendant, at the time this patent issued, and for many years previous, was in possession of a practical process of casting sound-records, whereby it is now making over 20,000 per diem. It is not, of course, pretended that Macdonald learned from Edison that the wax would, in cooling, shrink away from the mold, and could be removed by withdrawal lengthwise, or that he learned from Edison to make allowance for the shrinkage. When Macdonald used his first apparatus in 1896 the wax (being the same wax) shrunk and otherwise acted precisely as it does to-day. Where then did Macdonald learn that wax shrinks, and learn to take the shrunken casting out of the mold? He did not *invent* those things. He would certainly have sought to patent them if he had; but the history of his work and the wording of his patent specification, filed before Edison's patent issued, show that the contraction of the wax record was a known, or an obvious thing. This is, we think, conclusive proof of that fact; but Edison's own conduct fully confirms it, as already shown.

Therefore, we say that the present attack upon defendant's business is not only without justification, but is so utterly unwarranted as to be reprehensible and deserving of rebuke more severe than these administered in the cases cited above.

APPENDIX III.

Our attention has been called to a decision of the English High Court of Chancery in a suit involving a British patent No. 13344 of 1900, to one Lambert, for process of molding celluloid records (*Lambert Co. v. Phonograph Indestructible Record Co.*).

The opinion rendered by Mr. Justice Buckley is interesting, and in some respects pertinent. The patents involved different specific processes from those of the parties to the present suit, but, of course, cylindrical molds were used, and the contraction of the record in consequence of cooling was an incident of the process.

The following passage in the decision is pertinent, bearing in mind that Macdonald's patent describes the elimination of air bubbles while that of Edison says not a word on the subject, though he and his witnesses declare that it is essential.

"The contest has raged around this question of how the film of air is to be got out from between the record and the matrix. The patentee in his specification says not one word of any sort or description on that subject. Reading his specification one would suppose that the question of exit of air was not even present in his mind. It is impossible to put the plaintiff's case even so high as this, that they could say 'The defendants are infringing our patent, because they are using our indicated way of causing the expulsion of the air.' The patentee has in fact indicated no way for the expulsion of the air."

Again the court—referring to what was *matter of common knowledge before 1900*, said:

“that if you wanted to make a cylindrical thing you could do it by an *undivided dye*, whereas if you wanted to make a spherical thing you must have a divided dye in order to get your product out after it was made, of course, was perfectly well known.”

Again:

“To say to anybody if you are going to make a cylinder do not use a divided, but use an undivided die is unnecessary. *It seems to me to be a matter of mere common knowledge.* Any mechanic would have taken that step.

“Finally the court, speaks of the ‘freedom for the the record to shrink longitudinally, as it will do of course, in cooling.’”

If the claims of the patent in suit had come before this learned judge he would have disposed of them upon mere reference to matters of common knowledge, whereof the court may take judicial notice.